Government in 3D: How Public Leaders Can Draw on Virtual Worlds

David C. Wyld
Robert Maurin Professor of Management and
Director of the Strategic e-Commerce/
e-Government Initiative
Southeastern Louisiana University

IBM Center for
The Business of Government

Government in 3D: How Public Leaders Can Draw on Virtual Worlds

David C. Wyld
Robert Maurin Professor of Management and
Director of the Strategic e-Commerce/
e-Government Initiative
Southeastern Louisiana University

IBM Center for
The Business of Government

TABLE OF CONTENTS

F O R E W O R D

On behalf of the IBM Center for The Business of Government, we are pleased to present this report, "Government in 3D: How Public Leaders Can Draw on Virtual Worlds," by Professor David C. Wyld of Southeastern Louisiana University.

This report is another example of how Web 2.0's "teen toys" are quickly becoming serious work tools. Virtual worlds on the Internet have been seen as large-scale fantasy games. But now "virtual worlds have been labeled as a transformative development that will perhaps change the way we use the Internet over the next decade," according to Dr. Wyld's report.

Is this just hype? We don't know yet, but with the recent move by some state governments and congressional pushes in the federal government to promote "green" and to reduce traffic congestion by reducing travel, encouraging tele-commuting, and moving to a four-day workweek, the trend toward a virtual workplace seems to be growing. Moreover, if a job requires collaboration among members of a team, e-mail and conference calls can only go so far.

Wyld's cutting-edge report helps bring some concreteness to the topic of virtual worlds. He highlights ways in which government agencies are piloting the use of avatars and 3D worlds. For example, NASA uses one virtual-world platform—Second Life—to reach citizens in new ways. He also identifies some of the potential stumbling blocks to the rapid growth of 3D worlds, such as identity and interoperability issues. More importantly, he provides a broader context for public executives about how virtual worlds are becoming a social phenomenon, especially with the younger generations. This is a new way for emerging leaders to come to the fore, as well as an innovative tool for collaboration in the workplace.

Albert Morales

Mark Cleverley

All of this can seem unsettling to more traditional government executives. Nevertheless, Wyld suggests "we will see that tangible, real-world results will come from the collaboration, learning, and interactions that will come about in virtual-world environments." To help prepare government leaders for this new world, he has developed an executive guide for keeping up with the virtual world. Read it, try it, and good luck!

Albert Morales
Managing Partner
IBM Center for The Business of Government
albert.morales@us.ibm.com

Mark Cleverley
Director of Strategy
IBM Public Sector Government Transformation
mark.cleverley@us.ibm.com

EXECUTIVE SUMMARY

Virtual worlds, such as Second Life, are fast transforming the very definition of "being together." In these immersive environments of the "3D Internet," people from all over the country—indeed the world—can interact with one another in real time. As such, virtual worlds have been labeled as a transformative development that will perhaps change the way we use the Internet over the next decade.

In the first part of this report, we examine how pioneering government agencies are beginning to explore the use of virtual worlds for a variety of purposes. First, we consider how virtual worlds can be used to reach citizens in new and exciting ways. We begin with a look at the first congressional hearing held in Second Life. We then highlight the exciting efforts being undertaken by a number of agencies to engage the digital native generation. We follow with a look at the National Oceanic and Atmospheric Administration (NOAA), which has created a veritable "weather world" in Second Life to better educate citizens about climate conditions and emergency preparedness. We then examine the Centers for Disease Control and Prevention (CDC's) innovative educational outreach efforts in both the adult-oriented environment of Second Life and the kid-friendly world of Whyville. We conclude with a look at the National Library of Medicine and the National Aeronautics and Space Administration (NASA). In NASA's case, agency leadership sees the virtual world as an important tool not just to improve citizens' engagement with the space program but, in the near future, with space travelers themselves.

We then consider how agencies are using virtual-world environments in innovative ways on an internal basis. We begin with a look at how these environments are being used to foster collaboration between employees. By developing virtual water coolers, conference rooms, and meeting halls, agencies enable real-time conversations and conferencing while reducing costs and the need to travel to make collaboration happen. We then examine how the intelligence community is looking to virtual worlds to provide real-time interaction capabilities on a global basis. Next, we look at how virtual worlds can be used to facilitate training and simulations in agencies. "Serious games" hold great potential for revolutionizing both managerial training and training that is far more dangerous in "real life," such as for the military and for emergency preparedness/first responders. Finally, looking at the Second Health example from the United Kingdom, we examine how increasingly sophisticated simulations can be used to test and demonstrate policy alternatives.

We then look at how government agencies are venturing into virtual worlds to recruit employees. This includes both the U.S. Army and the U.S. Air Force, who actively use virtual environments—America's Army and MyBase, respectively—to gain new recruits. We then examine the efforts of NASA to engage today's high school and college students and develop their interest in math and science careers—hopefully with NASA—to develop the workforce it needs to achieve its future goals in space. We also look at the recent innovative efforts of the state of Missouri, led by its Chief Information Officer, Dan Ross (aka "CIODan Jefferson" in Second Life), to reach out to a new generation of IT workers. Finally, we head north of the physical border to see how both the Vancouver Police Department and the Province of Ontario have undertaken recruitment efforts in-world.

Finally, we examine how agencies are beginning to make use of virtual worlds for tourism and economic

development. While there have been many virtual reproductions of cities and landmarks built in Second Life by individuals and companies—from virtual New Orleans to Amsterdam—we have also seen governments recognize that the virtual world can be an important virtual gateway to their region, both in the U.S. and abroad. We explore "best practice" examples from the city of Galveston, Texas, and the Italian region of Tuscany. We conclude with a look at how such virtual-world sites will likely prove to be effective not just for promoting tourism, but for showcasing an area for economic development.

In time, we will see that tangible, real-world results will come from the collaboration, learning, and interactions that come about in virtual-world environments. We will also see public sector executives increasingly willing to shift financial, technology, and human resources to virtual-world projects as these success stories come about, and as we see cost savings and positive environmental impacts from lessening the "economy of presence."

However, several important issues arise from governmental involvement in virtual worlds, including:

- The "generation gap" in government information technology

- Identity

- Security

- Interoperability

- Accessibility

- Availability

- Staffing

- Virtual-world policies

- Return on investment (ROI) for public sector involvement

Each of these issues is discussed, offering options for public sector leaders and IT executives to consider as they and their employees approach virtual worlds.

In the second part of this report, we present an overview of the development of virtual worlds as nothing less than a social phenomenon. We begin with a look at the historical notion of having a "second life" in literature and film. We then examine the

rising popularity of online gaming, especially among the younger, "digital native" generation. We see that these virtual worlds—led by Massively Multiplayer Online Games (MMOGs)—are attracting millions of users, accelerating the growth of virtual worlds aimed at both adults and kids.

We then present a look at Second Life, the virtual world that has attracted the most attention to date from corporate, university, and governmental interests, due to the ability of organizations and individuals to create their own unique virtual places in this "game" that has no plot, script, or levels. We examine the history, demographics, and economy of Second Life, as well as the legal and operational problems associated with operating in this virtual environment. We see that numerous corporations have established in-world presences, conducting marketing and other activities in Second Life. We explore how virtual worlds are being used in innovative ways by organizations in other sectors, including libraries, museums, and higher education institutions. Finally, we look at how the virtual world is being increasingly integrated into real-world media and vice versa.

Gartner recently predicted that by the end of 2011, fully 80 percent of all active Internet users "will have a 'second life'" in the developing sphere of virtual worlds, "but not necessarily in Second Life." Thus, it is important for public sector leaders to be aware of the possibilities—and pitfalls—involved in the fast-developing area of virtual worlds. This report stands as both an overview of early developments in the realm of the 3D Internet and a look at the virtual road ahead.

Part I: The Use of Virtual Worlds of Government

Web 2.0 and Virtual Worlds

Introduction

With Web 2.0, it has become increasingly easy to create content and connect with others on the Internet. The Web 2.0 revolution has been spurred by the simple fact that these web activities "get more valuable the more people use them" (Kirkpatrick, 2008, n.p.). From posting videos on YouTube to listening to podcasts to connecting on social networking sites, Web 2.0 tools have become ever more immersive and increasingly interactive (see Figure 1). As such, these Web 2.0 tools have become omnipresent in our personal and, more and more, in our work lives.
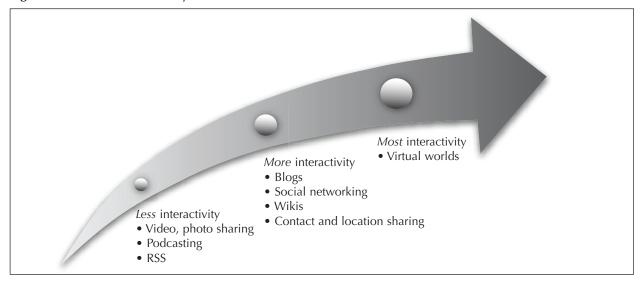
A year ago, this author explored the blogging phenomenon, examining how public officials could use blogs to improve communications and to increase civic engagement (Wyld, 2007). Since then, there has been an explosion of blogging activity, across both the federal government (Zyskowski, 2008) and at the state and local levels (Jackson, 2008). Virtual worlds have now come to the fore as the most interactive form of engagement available in today's Web 2.0 world, as the newfound ease of gathering people together and communicating in a real-time, customized environment—the metaverse—presents exciting new possibilities for the public sector.

Virtual worlds such as Second Life present new opportunities far different from "flat" websites or even other Web 2.0 tools, such as social networking, blogging, and video sharing. McGookin (2007) pointed out that the corporate and civic potential for virtual worlds such as Second Life is especially exciting in that the virtual environment offers:

- New and unique opportunities for engagement

- New ways to observe how individuals interact with and react to each other

Figure 1: Web 2.0 Interactivity

Most interactivity
• Virtual worlds

More interactivity
• Blogs
• Social networking
• Wikis
• Contact and location sharing

Less interactivity
• Video, photo sharing
• Podcasting
• RSS

- New ways to look at how individuals form friendships and alliances

- New opportunities to see how individuals and organizations employ social networking for both personal and professional purposes

Crovitz (2008) stated his hope that Web 2.0 tools, including virtual worlds like Second Life, can aid in the exchange of information and ideas between citizens and their public officials, perhaps making government more effective by helping create "a new consensus on where the wisdom of government begins and ends" (p. A13).

The Metaverse and the 'Economy of Presence'

Miklos Sarvary, director of the Centre for Learning Innovation at Insead, has drawn parallels between the life cycle of broadcasting and the Internet. Just as radio gave way to the more immersive experience of television, today's flat, single-user websites will morph into more interactive, immersive multiple-user experiences. In fact, Sarvary (2008) predicts that "within five years, the dominant Internet interface is likely to be the metaverse"—virtual worlds (n.p.).

Why are virtual worlds such an appealing concept to users and organizations? Primarily, it is simply because of the presence of others (Rappeport, 2007). To be aware of others, we need to be around them. However, in the virtual-world environment, we can change the definition of "being there." This is what William J. Mitchell, the former dean of architecture and planning at the Massachusetts Institute of Technology, means when he proclaims that the Information Age has brought about a distinct change in what he terms the "economy of presence." In the past, being "together" meant showing up physically, which "consumes resources and costs money," as heretofore "it costs us time and effort to get to places to meet people, conduct transactions, and see performances" (quoted in Garreau, 2007, n.p.). With the Internet, the economy of presence is upended, as it costs nothing to be together online.

Now, in the age of social networking, we can network together online. In the age of wikis, we can collaborate together online. And, in the age of virtual worlds, now we can be present together—or at least our avatars can be—in virtual space, with most

of the same benefits to being together in real life, but without the downside costs. Debbie Jeffers of the University of Delaware observed that Second Life can be considered "like Facebook, but better." This is because: "With Facebook and online chat spaces, you're just going back and forth with texts and not seeing the other person. The avatar brings you that next level up. You're much more connected to that person on the screen" (quoted in Greto, 2008, n.p.).

Virtual Worlds—The Next Big Thing?

"It's the next big thing!" How many times have we heard that and asked ourselves: Is this it—the Internet? The Web? Web 2.0? HD-DVD? Real estate? Now virtual worlds have been lauded as "the next big thing." Their growth has been hyped with nothing less than the highest of hyperboles, being hailed as the beginning of "a new industrial revolution." "The virtual world, in which people not only communicate across the Internet but create alternative online identities for themselves, will take over from all this as surely as the internal combustion engine replaced steam power" (Humphrys, 2008, n.p.). And, preemptively responding to the fact that some may characterize such a statement as "an absurd exaggeration," Humphrys (2008) asks one to simply consider all that has occurred in the short history of the Internet (n.p.).

Analysts have predicted that by 2020, "virtual worlds will be as widespread as the World Wide Web is now" (Rawlinson, 2007, n.p.), and there is a growing belief that virtual worlds may well "replace the web browser as the way we interface with the Internet" (Last, 2007a, n.p.). Indeed, some predict that virtual worlds will be as significant a technological disruptor as the invention of the personal computer or the advent of the Internet (Mims, 2007). In late 2007, Gartner predicted that by the end of 2011, fully 80 percent of all active Internet users "will have a 'second life'" in the developing sphere of virtual worlds, "but not necessarily in Second Life" (n.p.). While some have criticized Gartner's 80 percent projection for being overly optimistic (Wilson, 2007), there can be no doubt that the way we interact via the Internet is undergoing a profound change with the advent of virtual worlds.

We are shifting from today's 2D web to the future—what has been aptly described by many observers as

the "3D Internet." Overall, Second Life and the entirety of virtual worlds are still very much in their infancy, and analysts have predicted that we are not even at "the DOS era of virtual worlds" (Lamont, 2007, n.p.). Former Speaker of the House Newt Gingrich recently observed that the "3D Internet represent[s] a brand-new approach to collaboration. While it is true that it's still fairly primitive by the standards of having holograms or being face-to-face in more complex ways ... I think that 3D Internet in all of its various forms is going to become one of the great breakthroughs of the next 10 years" (quoted in Last, 2007b, n.p.).

And for government, it is important to go to where the audience is or where it is going. Janice Nall, who heads the Centers for Disease Control and Prevention's (CDC's) electronic health-marketing efforts, recently observed: "The idea is not to expect everyone to come to us. We've got to go out to wherever people are going for their health information" (quoted in Kauffman, 2007, n.p.).

Venturing into Second Life

If you've never been a virtual visitor to Second Life, it's easy to do so. In fact, many of the sites mentioned in this report have an SLURL (Second Life Uniform Resource Locator). In the same way that entering a URL link on a webpage, blog, or document will take you directly to that website, by entering the SLURL, you will be directed to that specific spot in the virtual world. To do so, however, you first need to be registered with Second Life.

1. First, go to the registration site for Linden Lab (the parent company of Second Life) at https://join.secondlife.com/?form%255Baction%255D=Skip+This+Step. There you will be asked to create a free account and register for an avatar—a virtual character that represents you within Second Life. In addition to providing the "normal" registration information, you will be asked to choose a name for your avatar and to create an initial look for the avatar (and the demographics of your online persona need not match your real-life description).

2. Then you will receive a confirmation e-mail. Click the link in the confirmation e-mail and your avatar will be created.

3. You will then receive a password for your avatar. If you haven't already, you'll need to download the Second Life viewer and install it on your computer. You can then use your avatar name and password to log in. When you first sign in, you will arrive in an orientation area where you can learn more about how to use Second Life.

4. After completing the orientation, you will be ready to venture to any of the sites mentioned in this report.

How Virtual Worlds Can Be Used in Government

Introduction

Dorobek (2007) advised that, in the public sphere or virtual worlds, it would be "the courageous few" who would be able to discover new and exciting applications that will serve as valuable lessons for the rest of us (n.p.). In this section of the report, we take a paper-based tour of what government agencies are "doing" in virtual worlds today. We will examine how virtual-world environments are being used:

- To reach citizens in new ways

- To collaborate internally

- To conduct training and simulations

- To recruit employees

- To promote tourism and economic development

We will see that government agencies have begun to make use of Second Life and other virtual worlds for a wide variety of purposes, including informational outreach, education and training, emergency preparedness and continuity, tourism, recruitment, and policy outreach. While these sites may have a primary focus, we will see that one of the significant benefits of being in virtual worlds is that a great amount of "spillover benefits" and "synergies" are involved in these efforts. As we will see, agencies may have multiple purposes for being "in-world," and they are finding that they attract visitors to their virtual-world sites for a variety of reasons. Thus, while a site may primarily be aimed at one audience or constructed for one purpose, it may produce positive "unintended consequences" in a large number of ways, such as:

- A tourism-focused site for a region may produce interest in economic development in the area as well.

- An agency's informational site may produce real-world job applicants.

- A college's virtual-world campus may produce real-world recruits for the institution.

- An agency's education-and-training-focused effort may produce positive media and publicity for the unit.

To Reach Citizens in New Ways

Congress

Writing in *Popular Science*, Newitz (2006) imagined a very real virtual-world scenario playing out in the virtual world: "Imagine a mixed-world meeting of the United Nations, or a mixed-world congressional hearing. Citizens could do more than watch on C-SPAN; they could actually participate by lining up at virtual microphones to ask questions through their avatars." With such innovations, she opined that virtual worlds like Second Life "might enable the electronic town-hall meetings that the Internet has long promised but rarely delivered" (n.p.).

Fast forward to April 1, 2008—yes, April Fool's Day—a day that may turn out to be a momentous day in the history of government. That morning, Representative Ed Markey (D-MA), as chair of the House Energy and Commerce Subcommittee on Telecommunications and the Internet, led a congressional hearing unlike any before. Members of Congress, witnesses, and interested observers gathered for the hearing in the Rayburn House Office Building. At the same time, in the virtual world of

Second Life, preparations had been made for the hearing to be the first held simultaneously in this online environment, where the hearing room had been faithfully replicated in virtual form (Chan, 2008a). Twenty pre-screened avatars—computer representations of individuals—filled the spectator area of the hearing room, ranging in appearance from young fashion-model types to a "woman wearing wings" and "a large bumblebee" (Hohmann, 2008).

The "real" Representative Markey handed over control of the hearing to his avatar, his online image, named appropriately "Ed Markey Alter"—a good likeness of the congressman. However, the real Markey noted that "my avatar actually looks like he's been working out" (quoted in Hohmann, 2008, n.p.). Ed Markey Alter, the only congressional avatar present in the virtual hearing room, then gaveled the hearing to order "in-world," stating: "Second Life highlights the benefits of an open, innovative Internet platform…. From education and health care, to solving global problems such as climate change, to the corporate world, people who never would have interacted before have been able to come together, communicate, and collaborate online" (quoted in Nylen, 2008, n.p.).

In this, the first congressional hearing in the online virtual world, executives from Linden Lab, the company behind Second Life, and IBM made presentations on the future of online worlds and responded to committee members' questions on some of the nefarious activities often rightly or wrongly associated with virtual worlds, including consumer protection, invasion of privacy, protection of children from predatory behavior, banking scams, money laundering, terrorism, and online addiction. Committee members exchanged their thoughts on virtual worlds, and the avatar observers in the crowd had a dialogue among themselves (Hohmann, 2008; Kaplan, 2008; Musgrove, 2008).

Overall, the mood in the hearing was light-hearted, as the real "star witness" was the technology itself. Representative Jane Harman (D-CA) quipped in the hearing that many already "probably think Congress itself is a virtual world" (Mone, 2008, n.p.) and kidded the chairman that "the real reason we're here is so that you can get some pointers on how to get past the seventh level of the World of Warcraft" (quoted

in Milbank, 2008, n.p.). Looking at the whole scene, Representative Anna Eshoo (D-CA) remarked, "I can't help but think of the phrase, 'get a life'" (quoted in Milbank, 2008, n.p.). But, in the larger sense, one must ask the question: "Is Second Life a harmless distraction from the real world or can it, and other online venues, be leveraged to reenergize political life … [in] an increasingly networked and multi-dimensional world?" (Roy, 2007, n.p.)

This was not Congressman Markey's first appearance in the virtual world of Second Life. In December 2007, he faced the familiar dilemma of needing to be in two places at the same time. He could not leave Washington due to pressing congressional business, but he had been invited to speak at the United Nations Climate Change Conference in Bali. So, Markey teleported to the conference in Second Life, using a computer at a staffer's Capitol Hill home. His avatar was dressed appropriately conservatively for a U.S. congressperson—dark blue suit, white shirt, green tie (Associated Press, 2007a). Markey addressed the conference in Second Life, stating: "I believe I am the first member of the U.S. Congress to be introduced by someone with a blue dragon on her shoulder.… This is my first foray into Second Life, but it won't be my last" (quoted in Anonymous, 2007a, n.p.).

He explained his dilemma, both to conference attendees in Indonesia and to those participating via Second Life, in the following manner: "I had to stay here in Washington to pass a clean energy bill that will make a down payment on the global warming cuts needed to save the planet. But it was critical to show the leaders gathered in Bali that they have partners here in America who are deeply concerned about solving global warming and re-engaging the United States on the global stage" (quoted in Miga, 2007, n.p.). Markey's virtual appearance was praised by observers, as it was noted that he had saved over five tons of carbon emissions by making his trip to the climate change conference a virtual one (Fogarty, 2007).

National Oceanic and Atmospheric Administration

The National Oceanic and Atmospheric Administration (NOAA) certainly has one of the more playful—and advanced—governmental presences in Second Life. It began with the championing of Eric Hackathorn,

who is now project manager for NOAA's virtual-world program, but who initiated the agency's Second Life presence on his own time in April 2006 (Kauffman, 2007). NOAA presently has two islands in Second Life:

- Meteora: http://slurl.com/secondlife/Meteora/177/161/27/

- Okeanos: http://slurl.com/secondlife/Okeanos/64/217/30/

Roush (2007) categorized NOAA's Second Life islands as "a kind of educational amusement park, a Weather World" (n.p.). On NOAA's islands, one can virtually experience:

- Taking a virtual hurricane hunter flight on a P-3 Orion

- Ascending on a virtual weather balloon

- Seeing a virtual tsunami hit a beachfront community

- Walking on a virtual glacier to explore the impact of global warming

- Riding under the sea in a virtual exploration submersible

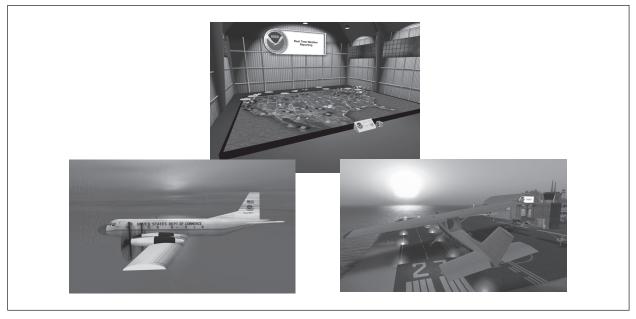- Exploring underwater caves and seeing sea life on a virtual scuba dive

One can also obtain real-time weather information about the real world while in-world. Aimee Weber (2006), whose design firm helped create a good portion of the NOAA site's creative content, believes that "NOAA's arrival may be a great sign of things to come. United States government agencies aren't exactly what you call flamboyant, trendy, or fashionable. Their interest in Second Life as a solid educational tool may give other companies a greater sense of comfort in the stability of the platform" (n.p.). (See Figure 2).

While the number of visitors to NOAA's Second Life site is a fraction of the number of visitors to the agency's traditional websites, the in-world user experience is amazingly "sticky." In fact, the agency reports that its internal metrics show that a visitor to its Second Life islands stays there 10 times as long as does a viewer of NOAA's other web offerings (Kauffman, 2007). Hackathorn recently commented on the value of NOAA's virtual-world program: "Second Life can help deliver your message in more of a storytelling fashion, which is more powerful than reading about it in a textbook. It's meant as much more of an interactive, experiential learning environment" (quoted in Nylen, 2008, n.p.)

Centers for Disease Control and Prevention

The Centers for Disease Control and Prevention, or CDC, has been an active player in multiple online

Figure 2: Scenes from NOAA in Second LIfe

Source: *NOAA's Virtual Islands in SciLands, www.flickr.com/photos/hackshaven/sets/72157594500016565/. Used by permission.*

virtual-world environments. In Second Life, the agency has established a very interactive, educational site (http://slurl.com/secondlife/CDC%20 Island/). John Anderton is associate director of communications science for the CDC. His Second Life avatar is a female one, named Hygeia Philo, after the ancient Greek goddess of health. Asked why the agency is involved in Second Life, Anderton said: "Avatars have the good fortune of being sort of eternally youthful and healthy, but each of those avatars is connected to a person and those people do have real health needs. It's people's health CDC is interested in, and people are using different tools to access health information" (quoted in Bain, 2007, n.p.). Anderton (2007) detailed that in Second Life the CDC has hosted health fairs and traveling health exhibits, as well as provided podcasts, videocasts, educational materials, and links to CDC publications, including the Morbidity and Mortality Weekly Report and the Public Health Image Library. Anderton (2007) observed, "Avatars are giving CDC another avenue to communicate CDC prevention messages about infectious and chronic diseases" (p. 38).

The CDC is also involved in the youth-oriented online world of Whyville. In this virtual world, the CDC ran a six-week-long promotion in late 2007 aimed at raising awareness among kids about the importance of flu vaccinations. They vaccinated over 20,000 Whyville residents against the virtual flu, who paid 5 Whyville "clams" (the site's virtual currency) for a shot. For those that did not get vaccinated, they "caught" a virtual flu virus at a children's birthday party. The "infected" kid avatars—known as "Whyvillians"—quickly broke out in red spots and their avatars had difficulty speaking (Kauffman, 2007).

The National Library of Medicine

The National Library of Medicine (NLM), a unit of the National Institutes of Health (NIH) and the world's largest medical library, maintains a Second Life site on HealthInfo Island (http://slurl.com/secondlife/Healthinfo%20Island/198/160/22). The island has both a consumer health library, a medical library, and displays from the NLM's Special Information Services (Pellerin, 2007; Cid and Bartlett, 2007).

National Aeronautics and Space Administration

The National Aeronautics and Space Administration (NASA) is a very active player in developing and exploring virtual worlds. As one writer pointed out: "NASA seems to be envisioning a future in which space missions occur not just in physical outer space, but simultaneously in the Ethernet … [which] kind of gives new meaning to the idea of 'space'" (Laurent, 2008, n.p.).

NASA is already "in" Second Life with a dedicated island that is a major part of the agency's strategy to gain collaboration not just from all NASA centers, but from non-NASA people as well, all in support of the space program. NASA's CoLab program originated at NASA's Ames Research Center (ARC) in San Francisco. Since its inception, it has grown to include members from most of the NASA centers. According to NASA CoLab (2007), its Second Life island (http://slurl.com/secondlife/NASA%20 CoLab/244/110/23) is an effort to:

- Engage stakeholders in designing and building the CoLab consistent with the values of the CoLab project.

- Prototype the physical CoLab in Second Life virtual space as a test bed before investing resources in building the actual physical CoLab.

- Enable technology entrepreneurs outside the San Francisco Bay Area to participate in and benefit from CoLab.

- Help ARC communicate the value of CoLab to other NASA facilities and external institutions.

- Create expertise within ARC in the important new online technology realm of "social software" in order to help ARC more effectively contribute to NASA's public exploration efforts.

Every Tuesday at 1 p.m. Pacific, virtual meetings—open to all interested—are held at the Space CoLab Island in Second Life (NASA CoLab, 2007).

NASA also hopes to use virtual worlds to better connect those on planet Earth to those engaging in missions to the stars. And with missions to the moon, Mars—and perhaps beyond—on the horizon, NASA is also looking to virtual worlds as a surprisingly practical way to overcome the isolation of lengthy space travel and to bring greater attention and interest to the

missions and the astronauts themselves. While the technological issues are considerable (especially the interplanetary time lag problem), the potential benefits of such immersive virtual environments in space travel cannot be overestimated. NASA is presently looking at virtual synthetic world technologies as a way both to allow astronauts to virtually link up with NASA engineers and managers to meet on mission-related matters and to connect with their friends, families, and even fans back on Earth.

Daniel Laughlin, the learning technologies project manager at NASA's Goddard Space Flight Center, said: "If we were meeting in Second Life or World of Warcraft to chat, we would both have the sense of being in the same place overlaid on our sense of physical location. The experience encodes into our memories as if we were in the same place" (quoted in Holden, 2008, n.p.). According to Jeanne Holm, chief knowledge architect at NASA's Jet Propulsion Laboratory, "We want to help our remote explorers 'phone home' in a way that lets them sit around a dinner table with their family, help their children with homework, and analyze the latest findings with their Earth-bound peers" (quoted in Holden, 2008, n.p.).

Robert Zubrin, founder of The Mars Society and author of *The Case for Mars*, stated that such connectivity—both electronic and psychological—could go a long way toward helping Mars-bound astronauts overcome the "long-term conditions of isolation, privation, and psychological stress" that they will experience on such interplanetary missions (op. cited in Holden, 2008, n.p.).

To Collaborate Internally

Conferencing and Collaboration

One of the great potential uses for Second Life and other virtual worlds is its ability to foster collaboration and "connectedness" in organizations and even beyond the boundaries of the organization itself. Analysts believe that virtual worlds are especially well suited for use as business tools, specifically to promote collaboration. As virtual-worlds observer Caleb Booker assessed: "We're not sure why yet, but there's something about seeing everybody's avatar in the room with yours that makes the whole experience far more effective than if you were to simply have a conference call. It creates a real

shared experience" (quoted in Rawlinson, 2007, n.p.). The benefits of meeting in cyberspace include the fact that such virtual environments help to:

- Overcome the isolation of workers dispersed at remote locations.

- Allow for interaction (both formalized events and the often much more productive water-cooler-like conversations) between workers at multiple sites.

- Reduce the need for people to get on a plane to be able to participate in virtual meetings or conferences.

Dave Elchoness, chairman of the Association of Virtual Worlds, has dubbed the metaverse the "global hallway" because, as he explains: "We know that real work doesn't get done in three-hour meetings or conferences. Instead, a chance meeting in the hallway or a 'drive-by' into your office is what really gets ideas shared and work accomplished" (op. cited in Greenfield, 2008). As Roo Reynolds, one of IBM's metaverse evangelists, opined: "The informality of a virtual world can lead to great conversations. It leads to discussions that otherwise would have been missed with the formality of older technologies" (quoted in Lynch, 2008, n.p.).

Corporations are finding that "in-world meetings are much more productive and effective than conference calls" (Rappeport, 2007, n.p.). This is because everyone in the virtual meeting can see and interact with each other's virtual avatar, communicating via voice and/or text chat and instant messaging with individuals or the entire group. McGookin (2007) predicted: "Looking down the road in, say, 20 years, business meetings in SL [Second Life]—or some equivalent alternative universe that doesn't involve air travel—may be as commonplace as sitting on the tarmac at LaGuardia is today, with all the economic and environmental implications that go along with that. For business, it seems like the borderless future envisaged a decade ago by Frances Cairncross in her book *The Death of Distance* is finally writ large" (n.p.).

The idea of making use of virtual worlds for collaboration is starting to take hold in the public sector as well. As discussed previously, NASA's Second Life presence fosters not just collaboration within the space agency, but also connections between staffers

and space experts and aficionados around the globe. In the United Kingdom, the National Physical Laboratory has helped create "Nanotechnology Island" in Second Life. The site was specifically created to allow scientists from around the world to meet and collaborate on projects (Humphrys, 2008). It is part of the larger SciLands project (http://www.scilands.org), which is a virtual continent for science and technology research organizations in Second Life.

The use of virtual worlds will open up and revolutionize the conference and convention business. The very notion of "going" to a conference and what that entails is radically changing. In 2008, the *Federal Times* deemed virtual worlds "an early glimpse into the future of government meetings." This is because the virtual world "breaks down the barrier of geography" (Mabeus, 2008, n.p.). According to *eGovernment Bulletin Live:* "Virtual worlds open up speeches, seminars, and lectures to wider participation and introduce a level of interactivity impossible in conventional websites. In a virtual world you can examine interactive working models and attend exhibitions that would be impossible in real life" (Anonymous, 2008a, n.p.).

One of the principal reasons for the interest in holding virtual conferences in virtual-world environments or augmenting physical conferences with virtual attendees is simply economics—primarily rising travel costs—which cannot be ignored in today's environment. In fact, according to projections from the National Business Travel Association, travel costs, including hotel rates, airfares, and car rentals, will increase upwards of 10 percent in 2008 alone (Greenfield, 2008).

The rising cost of being "present" at a particular time and place for an event, along with the opportunity costs of having to travel to an event versus simply logging in from one's laptop or office, means that virtual conferencing will grow exponentially over both the near and long term. The thought of "attending" and "participating" in virtual events is also in line with the present push for "green" business practices, as virtual conferencing not only saves money but also vastly shrinks the carbon footprint of such events. In doing so, conference organizers will be able to greatly expand the reach of their events, with little to no incremental costs for allowing virtual attendees and participants.

Central Intelligence Agency

Perhaps the "best" best practice example to date of internal collaboration is the Central Intelligence Agency (CIA). The CIA has established a presence in Second Life, with a few private islands exclusively for internal use at present. According to government officials, the sites are presently being used both for holding unclassified meetings and for training purposes (O'Harrow, 2008). It is possible that the agency could use public sites to better inform the public about its work and enhance the agency's image. It has also been suggested that intelligence agents and analysts could use virtual worlds as training and learning grounds for their real-world assignments, using their experience as avatars to learn how to interact—linguistically, culturally, and covertly—in a different culture (Brewin, 2007).

In the intelligence community, the new Intelligence Advanced Research Projects Activity (IARPA) office has been established to sponsor DARPA-like research to improve intelligence gathering across the various intelligence agencies and change the information-sharing mind-set from operating on a "need to know" basis to a "need to share" culture (Weinberger, 2008). In March 2008, Forterra Systems of San Mateo, California, and IBM announced their collaboration on a project, funded in part by In-Q-Tel, a technology investment firm funded by the U.S. intelligence agencies. The focus of the project is to develop a virtual-world environment in which members of the intelligence community could securely meet, interact, and exchange information.

The project, code-named "Babel Bridge"—in reference to the so-called "Tower of Babel" problem in the intelligence world of not being able to "talk" to each other because of different communications systems—has been described as a "digital war room." Here analysts, experts, and agents from various intel organizations will have their avatars, which will be clearly identifiable to their real-world counterparts, meet in this secure virtual environment (Forterra Systems, 2008). The system would enable analysts, experts, and agents in the field to securely view information from a wide variety of sources— from PowerPoint and audio files to images from spy satellites and drone aircraft—as part of their discussions, collaboration, and decision making (Greenberg, 2008).

Analysis

Certainly, this is an area where virtual-world solutions will garner a great deal of attention over the next few years. We will see quite quickly the ramping up of conferences held entirely in Second Life or other virtual-world environments (most likely private worlds accessible after gaining an access code via registration), as well as virtual-world "divisions" and simulcasts of real-world events. As has been discussed, the very notion of traveling to attend a conference may soon become passé, as the economics of presence and of rapidly increasing travel costs will combine to force more conferences and their attendees into the virtual realm. Thus, if your agency puts on meetings and conferences, a simple question to ask is, "Why are we not doing at least part of this virtually?" Today, there's simply no reason not to offer at least mixed-world (part real-world, part virtual-world) conferences.

Perhaps even more importantly, we will also see the migration of more "normal" team, group, and committee meetings into the virtual realm. The "global hallway" will become the "global conference room" as well. And it will not just be meetings between individuals scattered around the country or the county that will be engaged in such virtual-worlds-based meetings. Indeed, we will likely see virtual-worlds meetings include people even within the same building, but in-world rather than "in-meeting." As people discover the richness of in-world meetings, especially with voice chat capabilities, and as platforms such as Second Life stabilize these virtual meetings, avatars gathered around virtual conference tables will soon replace—or at least supplement in mixed-world forms—the conference calls of today.

Thus, one of the interesting aspects of virtual worlds is their capability to gather decision makers in real time to do what is done today in "real" meetings, conferences, conference calls, and videoconferences. As such, virtual worlds have a whole host of possibilities for use in not just normal governmental operations, but especially in emergency and military preparedness. There is a great deal of interest in using virtual worlds for such virtual meetings in emergency situations—from the Department of Homeland Security, the CIA, and the military to state and local emergency preparedness agencies. Such virtual-world forums can allow any official with a stake in a decision—whether responding to the potential landfall of a Category 5 hurricane along the Gulf Coast or reacting to a perceived terrorist threat—to engage in real-time collaboration.

To Conduct Training and Simulations

The use of simulations, both physical and computerized, has a long history in the training of military and emergency services personnel. In fact, the U.S. military originally developed the term "serious game" as "a more acceptable way to talk about 'war games' with Congress and the public" (Derryberry, 2008, n.p.). Such serious games are especially suited for not just military training, but learning exercises for first responders and other emergency personnel to practice responses to potentially catastrophic events in a safe environment. Such virtual reality simulations—or "serious games"—will be especially important as an alternative to live action training in life or death training environments and for conducting such exercises among remote participants. Such simulations eliminate travel or staging costs and provide the ability to literally "rerun" simulations and "tweak" exercises in unlimited ways.

The virtual environment also allows for better in-game and post-hoc analysis of training exercises through the use of machinima video captures of the course of simulated incident responses. Machinima, a form of filmmaking that uses the capabilities of the virtual-world technology to shoot films within the simulation, is exploding in use (Calongne and Hiles, 2007). (See the sidebar "What Is 'Machinima'?" on page 21.)

Also, training in a virtual environment is inherently safer than engaging in a "real" exercise. Thus, as Chris Badger, a spokesman for Forterra Systems, put it bluntly: "Every explosion that happens in a virtual world is a good thing. Every time a soldier is 'injured' in a simulation, they learn more about how to stay safe in reality" (quoted in Greenberg, 2008, n.p.).

Transportation Security Administration

The Transportation Security Administration (TSA) recently announced that it is looking to use video games—or what the agency terms "games with a purpose"—in order to train its 40,000 security screeners to improve the accuracy of its screening and improve customer service (Chan, 2007). With the far-flung nature of its workforce, virtual

---

Corporations and the Use of MMOGs for Managerial Training

Wagner (2008) asserted that urging organizations to make use of virtual games for training is no longer "techno-utopian silliness." He remarked: "Making work more fun doesn't necessarily mean doing it in a multiplayer online game like World of Warcraft. But it does mean that businesses need to take some of the techniques games like Warcraft use to make repetitive work fun" (n.p.). Indeed, virtual gaming may be a way of testing and developing leadership skills that can translate into "real world" managerial jobs (Gaylord, 2008).

In fact, a May 2008 cover story in the *Harvard Business Review* focused on just this subject. Reeves, Malone, and O'Driscoll (2008) highlighted how experience leading guilds in World of Warcraft and leading other forms of virtual teams—literally—in massively multiplayer online games, or MMOGs, is now translating into leadership skills that can be transferred to today's organizations. In fact, a study of over 100 IBM business team leaders who also led groups in MMOGs found this to be the case. However, these leaders also cautioned that the advance of the culture of gaming will require changes in the very way we think about organizations.

First, leadership in games is "a task, not an identity," and thus the leadership role a person assumes does not have permanence. In fact, one's role can alternate between leadership and followership. Also, organizational cultures will need to change in a significant way as well, such as a willingness to accept initial failures in order to achieve ultimate group success. However, the speed and pace of game play may be ideally suited for training how to lead people in today's increasingly fast-paced, technologically intense environment. Reeves, Malone, and O'Driscoll (2008) conclude:

> Games, and the generation that has grown up steeped in the game environment, may end up being catalysts for change in business leadership. This new crop of workers will bring with them—first as followers, then as leaders—game-informed notions about the best methods for leading. Ultimately, the entire workplace may begin to feel more gamelike—with game-inspired interfaces becoming 3D operating systems for serious work—which could enhance not just leadership but all sorts of collaboration and innovation. At the very least, digitally enabled environments and techniques could increase productivity by making many aspects of work simpler, less tedious, and—dare we say it?—more fun. That wouldn't necessarily be a bad thing (p. 66).

IBM is one of the leading companies seeking new and innovative ways to use virtual worlds in practical ways. The company guides its new hires through a virtual environment in which they attend an orientation session, sign up for their employee benefit programs, and learn how to do various tasks, including completing expense reports. The company has multiple islands in Second Life and routinely holds in-world events and meetings (Cummins, 2007).

---

environments would be a natural for training and simulations for the TSA.

U.S. Army

Dr. Roger Smith (2008), chief technology officer for the U.S. Army Simulation, Training and Instrumentation Program Executive Office in Orlando, Florida, released a paper in March 2008, tracing the use of simulations for military training from ancient history to today. Perla (1990) dated the use of simulations in warfighting back as far as the Roman Empire, with Roman commanders' "sand tables." These tables, which were a small copy of the physical battlefield, allowed for commanders to test their battle strategies using icons representing soldiers and units.

Since the 1980s, the U.S. Army has been a leader in using computer "games" as an active and reserve force-training tool—from tank simulations to combat mission simulators (Castelli, 2008). Today, the Army has an entire office dedicated to exploring the use of video games. At Fort Leavenworth, Kansas, as part of the Training and Doctrine Command's (TRADOC's) National Simulation Center, there exists the Project Office for Gaming, or TPO Gaming for short. The office was created in part out of the frustration that soldiers and units were often buying first-person shooter and military strategy games from Best Buy and other outlets—out of their own pockets—as a way of preparing for real-world situations. TPO Gaming is looking to create a simulation tool kit for creating realistic scenario training in virtual world, MMOG environments, with the target date for release between 2010 and 2015 (Graft, 2007).

The biggest challenge with military simulations, according to Colonel Jack Millar, director of TPO Gaming, is to create geo-specific terrain that is accurate enough to present mission-specific rehearsal and training capabilities (op. cited in Peck, 2007). Brigadier General Thomas Maffey, the Army's director of training, based at the Pentagon, foresees a range of simulations for a variety of training situations, stating: "While one game might provide excellent battlefield visualization, another might support training bilateral negotiation techniques" (quoted in Peck, 2007, n.p.).

One of the principal benefits of conducting simulations in virtual worlds is the ability to capture machinima videos of the experience. Robert Bowen, the civilian chief of TPO Gaming, stated that the goal is to able to "immerse that soldier into a virtual or synthetic environment, then have them conduct a training task, using their SOP [standard operating procedures], and then AAR [after-action review] that capability" (quoted in Anonymous, 2007b). Machinima makes such AARs easy to make, record, and use in the virtual environment for any form of training exercise or simulation, both military and civilian. Even perhaps more importantly, machinima can be used for far more than situations where there is the virtual terrorist explosion, toxic waste spill, or automobile accident. In fact, they may become part of all management simulations held in virtual environments, making it possible to review social interactions and leadership exercises in new and exciting ways with the same after-exercise capabilities.

Emergency Management Training

Simulations of emergency situations may be a "killer app" not just of Second Life but of all virtual worlds, in that they are cost- and time-effective. Robert Furberg, a research analyst for the Center for Simulator Technology at RTI International in Research Triangle Park, North Carolina, observed: "A full-scale [emergency response training] exercise takes a lot of advanced preparation and requires daylong drills—it is expensive and time-consuming. With simulation, we can run through a mass casualty event and change the parameters. Each case is a little different, and it is available 24/7" (quoted in Raths, 2008, n.p.). Such simulations also allow for participants to join in virtual training exercises from wherever they are, saving a great deal on travel costs. Virtual simulations allow for scenarios to be practiced and rerun repeatedly with differing scenarios and variables at play. And, as with military simulations, machinima video captures of virtual simulations allow for after-action review capabilities to allow for critiques and debriefings after concluding the exercises.

Randy Sickmier is the exercise plans manager for the Emergency Management Training, Analysis and Simulation Center (EMTASC) in Suffolk, Virginia—a nonprofit consortium between Old Dominion University and 17 private sector firms formed in 2005. He related the value in using virtual-world simulations for emergency management training by stating: "You've got a guy driving in to the EOC [emergency operation center] who hasn't sat in that chair in more than six months. During the day, he's

What Is 'Machinima'?

"Machinima" (muh-sheen-eh-mah) is a new type of computer animation created entirely within the confines of a virtual environment. The term is an analogism, based on the phrase "machine cinema," (and the misspelling has taken hold as the accepted form of the word) (Strickland, 2008). Machinima encompasses videos created by recording the action taking place in either single- or multiple-player video games (such as Halo, Quake, and The Sims) or in virtual-world environments, including Second Life and World of Warcraft.

Machinima videos can be entirely made using characters, settings, and props from within the virtual environment. They can either capture unscripted, live action within a game, or they can follow scripts and actual plots as determined by the machinima filmmaker (referred to interchangeably as *machinimists* or *machinimators*).

Using specialized, but not expensive, software that can be rather easily used to capture and record activities conducted within a game or virtual-world environment, machinima can often be hard to distinguish from far more expensive forms of traditional and computer animation. Today, machinima is moving from not just being used to capture game play or scripted game interactions for purely casual use to more sophisticated levels—for use in more traditional moviemaking and in making machinima films for training and education as well (Boelhouwer, 2007).

the public works officer for Staunton, Virginia, and all of a sudden he's in charge of some aspect of this emergency response. It's not something he does every day. This is where the simulation can be valuable" (quoted in Raths, 2008, n.p.).

The U.S. Department of Homeland Security (DHS), working with the Emergency Readiness and Response Research Center (ER3C) at Dartmouth College's Institute for Security Technology Studies, created a private island, named "Response," in 2005. The Synthetic Environments for Emergency Response Simulation (SEERS) project was established by DHS to prototype new virtual tools to conduct cost-effective disaster response rehearsals for emergency preparedness (Aitoro, 2007).

In 2006, the California Department of Health Services, aided by researchers from the University of California–Davis Health System, set up a virtual environment to train staffers in procedures for setting up emergency clinics in the event of a biological attack. Working in a virtualized representation of the California Exposition and State Fair built in Second Life, a dozen staffers participated remotely in the exercise geared to simulate the administration of antibiotics from the Strategic National Stockpile in response to a mock anthrax attack. The Second Life–based simulation was a replication of a real-life disaster simulation held at the same location two years earlier, one that involved

250 state employees and a thousand patient volunteers. The principal investigator on the $80,000 project, Dr. Peter Yellowlees, professor of psychiatry at UC-Davis, explained: "The aim of the exercise was to see if the state could constantly train people in setting up emergency clinics. One big advantage is that they could do this training 24/7 from wherever they are, and you don't have to recruit patient volunteers" (quoted in Raths, 2008, n.p.).

At the University of Maryland's Center for Advanced Transportation Technology, researchers are developing a virtual-world training exercise—encompassing many different traffic scenarios, from minor accidents to major incidents—for use by emergency responders in the I-95 Corridor Coalition (see Figure 3). These simulations can now include hundreds of participants playing out their real-world response functions in the virtual environment. Michael Pack, director of research for the University of Maryland center, observed: "It wasn't until we started to do elaborate demos that the first responders started to realize the true potential" (quoted in Lynch, 2008).

Training in the virtual environment can be more cost-effective—and realistic—in ways that staged disasters cannot. For example, in the simulated environment, if first responders fail to put on their safety vest or reflective jacket when approaching the scene of an accident, their avatar may be hit by

Figure 3: Screen Captures from First Responder Virtual Simulation

Source: Center for Advanced Transportation Technology (CATT) Laboratory, Civil and Environmental Engineering Department, A. James Clark School of Engineering, University of Maryland. http://www.cattlab.umd.edu/index.php?page=research&a=00028. Used by permission.

a car—a negative reinforcement that could not occur in a real-life training exercise (Lynch, 2008). Captain Henry de Vries of the New York State Police noted: "This project provides incident responders from all disciplines the opportunity to train together in real time for the purpose of learning the latest best practices in incident scene safety, coordination, and quick clearance of highway events" (The Center for Advanced Transportation Technology, 2008, n.p.).

Policy Development and Testing

McGonigal (2008) predicts that businesses and governments will be able to employ increasingly sophisticated alternate reality games (ARGs) as a means of "beta testing" virtual solutions to real-world problems. As such, these ARGs will likely emerge as a preferred alternative to traditional simulation and scenario planning exercises. Through such ARGs, not only could companies test new products and services, but government agencies could "beta-test" the potential impact of new regulations and laws. An example of the use of an ARG is the World Without Oil simulation (archived at http://worldwithoutoil.org) that was held in late 2007. This simulated exercise drew over 1,800 active participants who worked through a fictional oil crisis and how various energy markets, industries, and nations reacted to it (Barlow, 2007).

It has been suggested that agencies overseeing the financial sector, such as the Securities and Exchange Commission (SEC) and the Financial Accounting Standards Board (FASB), can employ such virtual tools to determine the likely impact of regulatory changes without risking real dollar impacts on companies and investors (Gaylord, 2008). Anne Laurent, a longtime commentator on the federal government, created a blog about virtual government (The Agile Mind, available at http://theagilemind.blogspot.com/). She recently observed that "not long from now, we will make laws, set policies, write regulations, and create programs by first 'playing' the likely consequences in synthetic worlds (quoted in Holmes, 2008a, n.p.).

Second Health

Perhaps the most comprehensive of all public sector policy outreach efforts in Second Life to date is being undertaken in the United Kingdom. Second Health is a joint project between the UK's National Physics Laboratory (NPL) and Imperial College London. It was created as a means to educate the British public and policy makers about the National Health Service's "Healthcare for London" plan, which called for the creation of a network of 150 compact medical institutions, or polyclinics.

In September 2007, Second Health went live in-world. Located in the SciLands region of Second Life, Second Health encompasses both the Second Health London Local Community Hospital (http://slurl.com/secondlife/Second%20Health%20London/125/207/27) and a polyclinic (http://slurl.com/secondlife/HealthLands/98/84/51). The main hospital contains various learning opportunities, including multimedia presentations on health topics and health care in the British capital. The virtual hospital will serve as a training ground for future doctors, who will be put through role-playing exercises as part of their real-world medical training.

From the perspective of Dave Taylor, managing director of the NPL's Second Health unit: "You can role-play extremely efficiently with Second Life, so we expect to be able to train medical students and GPs" (quoted in Kelly, N., 2007, n.p.). According to Dr. James Kinross, the value of Second Life in promoting the polyclinic concept is invaluable: "Second Life allows us to do things that have not been possible before, particularly with regard to visualizing abstract concepts. We wanted people to understand what a polyclinic was without them having to sit down and read a 300-page document. In Second Life we can create that place and have it function as a building, so people can walk around and see how it fits together" (quoted in Kelly, N., 2007, n.p.). Second Health has established a blog at http://secondhealth.wordpress.com/, where visitors can learn more about the project and view movies, presentations, and information specific to each department in the virtual hospital and about the polyclinics.

To Recruit Employees

We have seen early public sector outreach efforts in the virtual world directed specifically at recruiting employees, both in the near and long terms. These include the military, NASA, the State of Missouri, and the Canadian government.

U.S. Army

As discussed previously, the U.S. Army has a strong tradition of using simulation games for training. However, the Army is also a recognized leader in using such games as a recruitment tool. In fact, one of the most popular games available on the Internet today is "America's Army" (available at http://www.americasarmy.com). The idea of an Army-based military game being produced for the Army itself originated in 1999 with Colonel E. Casey Wardynski. Since going live in 2002, the MMOG has drawn approximately 9 million registered users who have put in well over 200 million hours of game play. In fact, it is ranked as one of the five most popular MMOGs on the web today (Derryberry, 2008).

The game allows for a "recruit" to progress from basic training to specialized training areas for combat and even medical training—both of which have been shown to produce real-world results in terms of training and preparation in the civilian and military realm. Not only do active and reserve soldiers play the game to sharpen their real-world warfighting skills, but there have been several documented cases where civilian game players have put their first-aid knowledge, gained in medic training in the game, to actual use (The America's Army Game Leadership Team, 2008). The game has shown demonstrable results in the recruiting area as well, as it was designed to reach out to a younger generation tuned into online gaming. According to Major Mike Marty, operations officer for the Army Game Project: "Recruits have told us that the game was a factor in shaping their interest in the Army or was part of their information gathering process on the Army" (quoted in Castelli, 2008, n.p.).

U.S. Air Force

On January 30, 2008, the U.S. Air Force's Air Education and Training Command (AETC) released a white paper titled *On Learning: The Future of Air Force Education and Training*, plotting the future of the service's recruitment, training, and education efforts through 2030 (United States Air Force, Air Education and Training Command, 2008). The white paper details the AETC's MyBase concept, showing how virtual worlds will be a key component of the Air Force's future vision for education, operational training, and recruitment. As General William R. Looney III, AETC commander, recently observed:

The young men and women who will lead our Air Force in the future have been living in a digital world their entire lives and are better prepared than any other generation to operate in this environment. It is imperative that we understand their needs and expectations, and develop an enterprise-wide system that fosters learning and captures their most critical asset—knowledge. Airmen must have systems in place that allow them to share their gained knowledge with others, to collaborate and to successfully operate and dominate in the world of air, space, and cyberspace. If the Air Force of 2030 is to be an agile, adaptive, learning organization, it must embrace change, accept risk, cope with reverses, and learn to reinvent itself—constantly (quoted in Virtual Worlds News, 2008, n.p.).

The MyBase project is thus specifically geared toward the "digital natives" that constitute the Millennial Generation. The Air Force believes that MyBase will not only be readily accepted by today's youth—because of their comfort with virtual worlds, social networking, and other Web 2.0 environments—but that it also will advance the service's readiness, capabilities, and effectiveness goals (Legrand, 2008).

NASA

In a vast departure from traditional governmental recruitment methods, NASA is also looking at creating its own MMOG. In January 2008, the space agency's Learning Technologies Project Office released a request for information to create an online world for NASA. This new game, to be developed in 2008 with private sector partners, would serve as a way for the agency to spark interest in math and science education and to recruit and even train engineers for work with the space agency (Sarvary, 2008). The agency believes in the educational and collaborative power of virtual worlds, stating:

Virtual worlds with scientifically accurate simulations could permit learners to tinker with chemical reactions in living cells, practice operating and repairing expensive equipment, and experience microgravity—making it easier to grasp complex concepts and transfer this understanding quickly to

practical problems. MMOGs help players develop and exercise a skill set closely matching the thinking, planning, learning, and technical skills increasingly in demand by employers. These skills include strategic thinking, interpretative analysis, problem solving, plan formulation and execution, team-building and collaboration, and adaptation to rapid change (NASA, 2008, n.p).

The game would be aimed at high school and college audiences, but the agency hopes to gain interest in its MMOG even among middle school students (NASA, 2008). As Chan (2008b) predicts, in the NASA virtual environment, rather than conquering levels or slaying ogres, players "can band together to conquer a common enemy: physics experiments" (n.p.). In doing so, the space agency believes it can generate interest in engineering and technical education in young Americans, as well as explore how it can tie recruitment into the online world.

The agency's goal is to attract high school and college students to pursue education and careers in the sciences, engineering, math, and technology. With ambitious plans to return humans to the moon and to explore Mars, the space agency stands to benefit not just by generating interest in its programs, but also by aiding in the creation of the next generation of scientists who can actually participate in these ventures (Holmes, 2008b).

As Daniel Laughlin of the University of Maryland Baltimore County, who also serves as a project manager for NASA's learning technologies project, observed: "To meet our mission we have to promote a bigger pool [of scientists] to draw from. If they go into the right career path, then there is potential for employment at NASA. [But] books, lectures, and other traditional tools that were good enough for baby boomers aren't enough for kids used to playing 'World of Warcraft'" (quoted in Castelli, 2008, n.p.).

State of Missouri
In February 2008, the State of Missouri held an IT Job Fair in Second Life, hosted by the state's Information Technology Services Department. The State of Missouri's CIO, Dan Ross (aka "CIODan Jefferson" in Second Life) posted a video message for the recruiting fair, which was designed to attract

interest in IT careers with the state and to attract applicants for current IT openings with the state (Huffhines, 2008). Ross is high on the prospects for using Second Life not just for this purpose, but also for wider uses in education, outreach, and economic development, especially because it is a low-cost way of reaching the so-called Millennial Generation. He observed: "By some estimates, over 40 percent of IT professionals trust and regularly use one or more social networking sites like Second Life to communicate with peers and conduct business. I think this community will be pleased that the State of Missouri has made the effort to reach out to and meet them where they hang out" (quoted in Shepherd, 2008, p. 1). A video chronicling the Missouri effort is available for viewing at mms://wmvstream.dese.mo.gov/ITSD-Interview.

Canada
Two best practice examples come from Canada. In May 2007, the Vancouver Police Department launched its presence in Second Life, aiming to use their site primarily as a recruiting tool to better locate tech-savvy recruits for their force. The site came about through the Vancouver police working in conjunction with a consortium of four local universities in the region. Student designers made sure that all Vancouver police officers operating in-world have avatars outfitted with uniforms replicating those of the police officers—and customized to realistically match their real-world appearance, down to their bald spots (Eustace, 2007).

Inspector Kevin McQuiggin, who heads the Vancouver Police Department's tech crimes division, believes that Second Life recruitment is a natural today. McQuiggin observed: "As we move into the future, we're going to need people who understand technology—that are conversant with it, that understand the impact of it, and understand how to use it" (quoted in Eustace, 2007, n.p.).

Note: The Vancouver PD event was temporary. It was hosted by Centre for Digital Media in Vancouver, BC (cooperatively operated by the University of British Columbia, Simon Fraser University, Emily Carr Institute of Art + Design, and the British Columbia Institute of Technology). The centre has a virtual campus in Second Life at http://slurl.com/secondlife/University%20Project/150/84/23.

Likewise, the provincial government of Ontario was looking for an innovative way to stir interest in public service jobs in the region. Working with Long Island, New York–based TheSLAgency, Ontario Public Service created a Second Life presence to help "sell" potential workers on a whole range of potential career positions with the provincial government. Using a range of multimedia to present information on various jobs and locations, the site also affords visitors the chance to play virtual firefighter in a game and to test specimens in a virtual medical laboratory (Thatcher, 2008).

The Ontario Public Service has a permanent site (OPS Careers in Second Life), located at http://slurl.com/secondlife/OPS%20Careers/122/129/27/.

Analysis

The virtual world opens up possibilities for improving and enhancing the entire recruitment process. As we have seen, virtual worlds can be a great way to recruit a tech-savvy workforce—which, by the very nature of such environments, are self-selecting as being highly technologically skilled. As discussed previously, companies are fast recognizing this, participating in virtual job fairs and even recruiting and interviewing job applicants in-world. We have seen early adopting governmental entities, such as the State of Missouri and the Province of Ontario, as well as the Vancouver Police Department, use Second Life as a platform for holding job fairs and hosting career information in-world to spur job applicants. We have also seen early efforts by NASA and the U.S. Army and Air Force to engage in short- and long-term recruitment efforts to generate immediate applicants and to spur student interest in pursuing a particular educational or career path. These agencies have realized that today's student may become tomorrow's engineer, mathematician, or soldier.

It is just smart business to realize that if agencies want to recruit tech-savvy students and applicants—in the next year and perhaps even over the next decade—they must appeal to them with cutting-edge technological tools in "their" environments. Thus, agencies may first want to create games, rides, and experiences in virtual worlds to grab students' initial attention and participation, with the goal that over the long term this will produce real-world workers that will benefit the agency's mission.

Of course, online recruitment will bring a whole new set of benefits—and issues. Agencies will find that they will be able to greatly reduce the travel and opportunity costs for participating in job fairs and conducting job interviews online, due to the fact that in-world work eliminates the economy of presence from the recruitment equation. While an agency may be able to cast a much finer net in-world to garner interest in careers and jobs in its specific niche, this will certainly bring unprecedented legal issues that will take years to work out. For instance, do in-world job fairs limit access only to those with access to the material resources (high-end computers and high-speed Internet) to participate in these events? Is it discriminatory to "hire" based on an avatar's appearance? Can machinima videos of interviews held in a virtual environment be used as evidence of bias? Issues such as these are indeed potential legal land mines, and they will need to be addressed by legislative and judicial actions so that our employment laws catch up with the reality of the 3D Internet.

To Promote Tourism and Economic Development

As noted by Yuen-C and Hou (2007), people will increasingly base their real-world impressions on their digital encounters with online manifestations of peoples, cultures, and nations in virtual worlds. While there have been many virtual reproductions of cities and landmarks built in Second Life by individuals and companies—from virtual New Orleans to Amsterdam—we have also seen governments, both in the U.S. and abroad, recognize that the virtual world can be an important virtual gateway to their region.

Galveston, Texas

In the U.S., while various tourism agencies and chambers of commerce are—or at least should be—looking at how to use virtual worlds as gateways to their locales, the American best practice example is Galveston, Texas. In May 2007, the Galveston Convention & Visitors Bureau opened a virtual Galveston Island in Second Life (http://slurl.com/secondlife/Galveston%20Island/31/96/27). The aim, according to Jim Cordell, vice president and chief creative officer at Galveston.com, was "to give digital travelers a chance to introduce themselves to the best aspects of Galveston Island" (quoted in

Zimmer, 2007a). Thus, on the island's virtual island, visitors can visit a number of re-created attractions, including the beachfront, the sea wall, and The Grand 1894 Opera House. They can ride a downtown trolley or a roller coaster at the virtual Moody Gardens. A video tour of virtual Galveston Island can be viewed at http://www.galveston.com/video/secondlife.

Tuscany, Italy

Au (2008a) observed that Europeans are at the forefront of using Second Life as virtual gateways to their countries and regions (see the sidebar "Embassies in Second Life" on page 28). A best practice example can be found in Tuscany. The Intoscanas Fondazione Sistema Toscana, which is the official tourism foundation of for the Italian region of Tuscany, opened Toscana Island (http://slurl.com/secondlife/toscana/85/215/105) in Second Life in late March 2007 (Zimmer, 2007b). On Toscana Island, visitors can explore Tuscan arts, culture, and landmarks, including:

- The Tower of Pisa

- The Piazza del Campo

- The Piazza Grande

- The Ponte Vecchio

- The Duomo in Florence

The site has grown to a virtual archipelago of six islands. It includes the Intoscana Store, where virtual-world visitors can purchase real-world items from the region. Also, in response to visitors who wanted to vacation or live in virtual Tuscany, the tourism agency opened up an island where avatars can build or rent their own virtual villas or beach houses (Fondazione Sistema Toscana, 2007).

In October 2007, Toscana Island hosted the Festival della Creatività (Creativity Festival), in which visitors could enjoy a number of special events, including the opportunity to take lessons in Italian from Scuola Leonardo da Vinci, a leading Italian university (Villiger, 2007).

Analysis

As we have seen with examples in this report, a virtual-world presence can significantly enhance the ability of a city, region, state, or nation to expand its tourism outreach. Second Life allows the creation of virtual gateways to a particular area. Tourism agencies and convention and visitors bureaus, working independently or, hopefully, in conjunction with local development partner private sector firms and/or local colleges or universities, can create virtual environments that will entice new visitors to their region. At the same time, they may also serve a greater good, providing virtual tours to those who, for whatever reason—time, economic, disability, etc.—may never be able to visit in real life, but be readily able to do so in their virtual lives. As we have seen, in Second Life, pioneering governments can create not just informational sites (with multimedia to "show" potential visitors what they can do and see in the area), but involving actual sites. Why not create a virtual roller coaster, aerial ride, or rafting trip that will take visitors' avatars on a pre-programmed "experience," taking them past major landmarks and sites of interest? Doing so can open up a world of experience to everyone about your locale, building up the image of and interest in your specific corner of the physical world to everyone who is in the virtual one.

Just as national and local governments are fast discovering the efficacy of establishing virtual tourism sites, so too will economic development become a significant and achievable goal of 3D Internet projects. Virtual-world sites will likely prove to be an excellent, low-cost showcase for an area or a region pursuing economic development activities. One can well imagine that sites can be tailored to take prospective business owners and developers on virtual tours of a region (yes, likely in a hovercraft or a monorail, just for fun). In doing so, the often unexciting economic, demographic, geographic, educational, and workforce statistics can be made to come alive in a way that no PowerPoint slide show could ever do. One could even "customize" a visitor's experience for a particular economic development project—for example, showing the virtual model of the city in a way that would allow corporate executives of a potentially expanding or relocating manufacturing firm to tour the city after their plant has been built.

One could even, as has been suggested previously, use such modeled virtual worlds not just to test policies, but to test the impact of new development

Embassies in Second Life

A number of countries have opened virtual embassies in Second Life. These include:

The Maldives. http://slurl.com/secondlife/Diplomacy%20Island/205/94/23. In May 2007, the tiny Indian Ocean island nation of the Maldives became the first country to open a "virtual embassy" in the Diplomatic Quarter of Diplomacy Island in Second Life. Maldives Foreign Minister Abdulla Shahid remarked that the virtual embassy "offers another channel for us to provide information on the country, to offer our viewpoint on issues of international concern, and to interact with our partners in the international community" (Anonymous, 2007c, n.p.). The virtual embassy, which resembles a beachfront retreat, offers tourist information as well as information and links to official government offices. The site was built by Maldives officials, working in cooperation with the Diplo Foundation (www.diplomacy.edu), a nonprofit foundation based in Malta that works to assist all countries, particularly those with limited resources, to participate meaningfully in international relations (Talamasca, 2007). The virtual embassy is seen as a point of pride for the island nation, as Stewart Gibbon of the Maldives Mission to Switzerland noted: "The Maldives is not the wealthiest island in the world. This can give people a contact with the Maldives that they might not otherwise have" (quoted in O'Mahony, 2007, n.p.).

Sweden. http://slurl.com/secondlife/swedish%20institute/70/212/30. The Swedish Embassy in Second Life is a virtual representation of Sweden's embassy in Washington D.C. This virtual "House of Sweden" provides visitors with information about Sweden and links to the Swedish government's online portal. Olle Wästberg, director general of the Swedish Institute, an agency of the Swedish foreign ministry, said of the virtual embassy: "Reaching out internationally, to an increasingly selective crowd, calls for an inventive and progressive way of working with communication. It is of great importance that we find our target groups where they are most likely to be open to our information, in their own context. Second Life is one of many alternative channels we ought to look further into" (op. cited in Cummins, 2007, n.p.).

Estonia. http://slurl.com/secondlife/Virtual%20Estonia/113/144/33/. In late 2007, the Eastern European nation of Estonia opened an official embassy in Second Life. The goal of operating the virtual embassy is to help promote Estonia as a real-life destination for not just tourism, but business, technology, and even artistic interests. Estonian officials see their Second Life presence as a way to connect with countries where the nation does not have a "brick and mortar" embassy, so that their Second Life island indeed functions as a "virtual embassy." Indeed, the embassy is routinely staffed by an avatar representing the "Estonia Republic," who can answer questions and help guide visitors through the embassy, which includes meeting places, information, and an art collection (Riley, 2007b). The site is unique among Second Life embassies, as it emphasizes Estonia's push for a high-tech economy and an information society (Llewelyn, 2007).

Kazakhstan. http://slurl.com/secondlife/Astana%20City/246/127/3. In the Republic of Kazakhstan, developers—with the blessing of city administrators—established "Second Astana" in Second Life, creating a virtual gateway to the capital city of Astana. The virtual environment features the major tourist destinations in Astana, re-creating a major section of the city—from the central block of the modern Astana Baytereka Pyramid to the Palace of Peace and Accord. The developers' plan is for other major tourist destinations in Kazakhstan, such as Almaty, Turkestan, and Borovoe, to be made into virtual form as well (Anonymous, 2008c).

Serbia. http://slurl.com/secondlife/Serbia%20Island/128/128/0. While not aimed at tourists per se, perhaps the most unusual Second Life outreach application in this area is being undertaken by the government of Serbia. The Serbian government estimates that there are between 2 and 4 million Serbs living abroad. Thus, it has a Ministry of Diaspora, which seeks to reconnect Serbs to their homeland. In late 2007, the Diaspora Ministry announced a partnership with Publicis Groupe, a European advertising and marketing agency, and Telekom Srbija, the country's phone and Internet provider, to create a virtual Serbia in Second Life. Minister Milica Čubrilo believes Second Life will aid her agency's outreach efforts, stating: "Many [Serbs] don't know there is Ministry of Diaspora, or they are on negative terms with official institutions. This way we hope to make connections in a less formal way of communication, with people who usually don't approach state institutions" (quoted in Kimban, 2007, n.p.).

and whether or not the projected benefits of a new development would outweigh negatives like increased traffic, school crowding, and environmental impacts. While computers today can "crunch the numbers" and convey potential outcomes, virtual-world environments could both tell and sell the story in a manner far more convincing and immersive than anything comparable today. Thus, such virtual-world testing and modeling will likely rise in importance not just for government agencies involved in economic development, but for both corporate interests and interest groups, such as environmentalists and other special interest advocates. Indeed, one can even envision competing virtual-world experiences and models showing different outcomes, depending on the perspective of the player.

Issues Facing Government in Implementing Virtual Worlds

Overview

The path to the virtual world holds both great prospects and serious issues for governmental executives to consider. In this section of the report, we will examine issues surrounding governmental involvement in virtual worlds, including:

- The "generation gap" in government information technology

- Identity

- Security

- Interoperability

- Accessibility

- Availability

- Staffing

- Virtual-world policies

- Return on investment (ROI) for public sector involvement

The Generation Gap

Young IT workers perceive government technology as being antiquated overall, and by the time new technologies are approved for use, they are often out of date or of little use. This new, tech-savvy generation sees the stability of government work as a positive, but desires to use new technologies to achieve information sharing and knowledge management (Gross, 2007).

Writing in *Government Executive*, Noyes (2007) thus spoke of the importance for public sector managers to recognize the growing importance of so-called "Shadow IT"—government employees using a whole host of unapproved, unauthorized Internet applications, including everything from blogs, social networking, user-generated video, instant messaging, and Second Life. Noyes pointed out that technologies that are now accepted as standard and essential parts of daily working activities, such as videoconferencing and wireless Internet access, initially faced widespread opposition from agency executives and IT departments. Lomas (2007) observed that "digital natives, who have grown up with the notion of socializing online, bring their penchant for living a second life to the workplace" (n.p.). (See the sidebar "Digital Natives and Digital Immigrants.")

As such, digital natives are going to change the way business is done through their innovative uses of Web 2.0 technologies like wikis, blogs, social networking—and virtual worlds. All too often, however, organizations and their information technology departments—mostly composed of digital immigrants—simply "ban what they don't understand." In doing so, they are not just stifling innovation, but risking the morale of their younger workers, who see access to the web and more as almost a right at work (Ranger, 2007a). This stands in stark contrast to the traditional government IT mind-set of blocking and restricting access to new web technologies. For instance, Shachtman (2007) observed: "The U.S. Defense Department's regulations on installing video games within one's workstation can be summed up in one word: Don't! Or, at least don't do it without first submitting the software for an elaborate testing and accreditation process" (n.p.).

With the new Web 2.0 tools out and on the horizon, Noyes (2007) raised the provocative question of "how realistic is it to expect users to steer clear

Digital Natives and Digital Immigrants

Why are virtual worlds such an appealing concept to both organizations and learners today? The answer can be found in a generational quake that is occurring in real time and being hotly discussed in the education literature. Today's younger generation can be said to be "digital natives," a term coined by Marc Prensky (2001) to describe today's generation as being "native speakers of technology, fluent in the digital language of computers, video games, and the Internet."

All of us who are old enough not to be native to the digital culture are thus said to be "digital immigrants." As such, while we may adopt many aspects of the technology, akin to those who learn a second language, "we retain an 'accent' because we still have one foot in the past" (p. 1). As immigrants, according to Jukes and Dosaj (2008), parents, educators, and political and corporate leaders—all largely digital immigrants—can be said to "speak DSL, digital as a second language" (n.p.).

Prensky (2006) concluded that members of the younger generation "generally have a much better idea of what the future is bringing than we do." This is evidenced by the fact that digital natives are readily "busy adopting new systems for communicating (instant messaging), sharing (blogs), buying and selling (eBay), exchanging (peer-to-peer technology), creating (Flash), meeting (3D worlds), collecting (downloads), coordinating (wikis), evaluating (reputation systems), searching (Google), analyzing (SETI), reporting (camera phones), programming (modding), socializing (chat rooms), and even learning (web surfing)" (p. 8).

of the increasing array of cool technology tools?" (n.p.). Alan Paller, the SANS Institute's director of research, opined that such "resistance is futile," and that such Web 2.0 tools, rather than being time wasters, can actually help improve both connectivity and productivity in younger workers, who are part of an increasingly "intensely interactive, 'high-fidelity, high-bandwidth' culture" (quoted in Noyes, 2007, n.p.).

Over time we will see the rise of the gaming generation into positions of prominence in the military and throughout government. With this generational succession, R. Smith (2008) foresees the growing acceptance of computer simulations, concluding: "Each generation is comfortable with a different set of technologies. Just wait for those that use games to move into positions of power" (p. 7).

Anne Laurent recently observed that the use of gaming and virtual worlds by the next generation of public sector leaders, both elected and appointed, will come about because they will simply "expect and demand it." She commented: "These people will not, cannot, manage information on paper or in spreadsheets or online dashboards. They will not endure the kludgy, slow, inefficient process of learning new software and keeping that knowledge up to date merely to be able to manipulate data…. They will demand to see and touch and manipulate what is known about problems and to 'play' possible

solutions so they can view the likely outcomes before choosing how to proceed" (quoted in Holmes, 2008a, n.p.).

Identity

In the view of Wikipedia founder Jimmy Wales, "When people decide to interact anonymously with no stable identity, then bad behavior is the usual result" (quoted in Lynch, 2007, n.p.). In fact, Gartner warned that the lack of verifiable identity control or access management is a major deficiency in public virtual worlds (Anonymous, 2007d). This is a significant limiting factor in making use of virtual worlds. In fact, it has led Gartner to recommend that organizations look to establish private virtual worlds that can be hosted behind a corporate firewall to ensure a confidential, secure, identity-assured environment for collaboration and meetings (Havenstein, 2007). Such secure, private virtual-world environments can allow organizations to gain the communication and collaboration benefits of this technology without opening them up to the downside risks of a public environment (Beer, 2007).

As business and governmental use of virtual worlds accelerates, identity issues will become increasingly important. As Ranger (2007b) noted, there will be a market need for helping people have ways to manage their digital identities. It's possible to envision services that would allow an individual to select which of his avatars he wishes to use to represent

him in a business meeting in a private virtual world versus how he is represented when he visits one of Second Life's nightclubs. As McConnon (2007) observed, such control over your online identity and representation "could mean that you appear as a cartoony purple-haired digital person in a social virtual world but that your outfit morphs into a corporate suit when you enter your employer's 3D site" (n.p.). Thus, as Bollier (2007) expressed, "The ideal … would be for people to be able to set their identities to be expressed automatically in role-dependent and context-dependent ways" (pp. 37–38). This may well be a function where government could set standards or even play a role in administering a system. More likely, trusted source verification entities, such as today's TRUSTe, will develop such identity management systems for virtual worlds and their users.

Security

Security concerns will certainly be coming to the forefront as governments move into virtual worlds. Consider what happened when the British government recently opened its virtual-world site for beta testing on an invitation-only basis. In March 2008, hundreds of hackers maliciously attacked the UK government's "SafeLife.org.uk" site—a site intended to launch in 2009 to, ironically enough, educate consumers about online security. The estimated 100 hackers were believed to be Russian in origin.

Selling Esteem Ltd, the firm contracted to build the online world, revealed that hackers had gained access to administrator privileges in the beta virtual world, turning their firm's technical staff "into helpless onlookers" (Dunn, 2008, n.p.). Needless to say, the company's plan to have UK Prime Minister Gordon Brown appear in-world as an avatar had to be placed on hold after the hacking took place.

According to Wagner (2008), the advantage to using virtual worlds for collaboration is that it is cheap, relatively easy, and quick to set up. The primary disadvantage—at least to using Second Life—is that it is a public environment that today cannot be put behind a firewall, although Linden Lab is now discussing developing hosted solutions and opensourcing its software to allow for private virtual-world development. Indeed, security concerns have kept many executives from making major investments in virtual worlds.

To counter such fears, in April 2008, IBM announced that it would become the first company to host private regions of Second Life, hosted on its own servers and available to IBM employees (and invited guests) behind the company's firewall (Pasick, 2008). Using Linden Lab's Second Life Grid, IBM was using the firm itself as a test bed for developing "enterprise-quality" virtual worlds that would allow for organizations to create private, behind-the-corporate-firewall virtual-world environments in which their employees could collaborate and meet, while allowing their avatars to seamlessly cross between this private environment and the public world of Second Life itself. Ginsu Yoon, Linden Lab's vice president of business affairs, hailed the capability of deploying Second Life behind the corporate firewall as "a major milestone in the evolution of the Internet and [one that] will help accelerate the growth and adoption of all virtual worlds" (quoted in Koman, 2008, n.p.).

Interoperability

One of the critical issues going forward will be the need for interoperability between virtual worlds. In the view of Mims (2007), Second Life is today's virtual-world equivalent of companies such as AOL and Compuserve, which in the early development of the web were "the online walled gardens of yore" (n.p.). What is needed is "the equivalent of the World Wide Web of virtual worlds" where standards would allow users to navigate and move their avatars and objects between worlds from a single interface (Mims, 2007, n.p.). Or, as Henry Kelly (2007) termed it, "an HTML for Virtual Worlds" (n.p.). Through software development, we will move to what Rose (2007) termed the "virtual universe," where we will see the capabilities to "allow avatars to leap from Second Life to World of Warcraft as easily as we now move from Google to Yahoo" (n.p.).

There is thus a need for open standards that will allow this to occur in a secure manner, and this may well take at least a decade or more of development. At present, Linden Lab and IBM are leading the effort to make such interoperability a reality, working in a cooperative manner with numerous technology and virtual-world companies (Terdiman, 2007a). It has been suggested that such interoperability standards should be approved and administered by a recognized standards group, most likely the ISO (International Standards Organization), in order to gain universal acceptance (McConnon, 2007, n.p.).

Writing in *Technology Review*, Colin Parris (2007), IBM's vice president of digital convergence, predicted that such open, secure standards will make possible "amazing transformations" in which innovations made in one virtual world can reach a much broader audience and be leveraged across the entire 3D Internet. As has been the case with the growth of the Internet, such interoperability will allow the "network effects" of virtual worlds to be much greater (Lohr, 2007).

Of course, as Henry Kelly (2007) observed, the issue of interoperability may well be settled not by cooperation but by competition. If Second Life or another virtual world were to achieve market dominance, then there would be de facto interoperability forced onto the marketplace.

Accessibility

For federal agencies, one of the first issues that will need to be addressed is accessibility. Section 508 of the Rehabilitation Act, as amended in 1998, requires that all federal agencies' electronic and information technology be accessible to people with disabilities. This Section 508 requirement applies equally to agency employees and members of the public. Clearly, analysts inside (Koudry and Weaver, 2008) and outside (Hansen, 2008) of the federal government have noted that Section 508 would apply to all federal forays into Second Life or any other virtual-world environment. Section 508 requirements should be at the forefront of IT executives' concerns today, as earlier this year the General Services Administration (GSA) announced that it would initiate assessing agencies on their Section 508 compliance efforts (Miller, 2008). Thus, as Huffhines (2008) noted, it will be incumbent on agencies involved in virtual-world projects to ensure that all information and events available in-world are available in alternate web-based venues or accessible in other forms. Koudry and Weaver (2008) advised that federal agencies should primarily use virtual-world forums as a supplemental source of information and that under no circumstances should Second Life or any other virtual world be the sole channel for distributing information.

Brian Kelly (2008) recently commented: "If your views on accessibility are based on compliance with guidelines … and you feel that all digital resources must be universally accessible to everyone, you may feel that an inherently graphical and interactive environment such as Second Life is unlikely to be accessible" (n.p.). He went on to point out numerous examples of how the lives of people with a range of physical and mental disabilities were actually enabled and enhanced through their participation in Second Life.

Thus, while it will be necessary to focus on providing alternative venues for virtual-world content, it is ironic that one of the really unintended but very positive consequences of the rise of virtual worlds is the fact that virtual worlds are generally very accommodating environments for tens of millions of individuals who are physically challenged. Indeed, from the perspective of Peters and Bell (2007), virtual worlds can "level the playing field" for persons with disabilities. For instance, with the introduction of voice chat, Second Life has now opened up to the visually impaired, who could not participate when text-based chat was the only means of communication (Peters and Bell, 2007). As Stein (2007) said so eloquently: "These increasingly sophisticated online worlds enable people to create rich virtual lives through 'avatars'—identities they can tailor to their desires: Old people become young. Infirm people become vibrant. Paralyzed people become agile" (n.p.).

Availability

One of the distinct challenges for organizations operating in Second Life or any other virtual-world environment will be to make their interface and content available on mobile devices. Indeed, the Yankee Group (2007) released a major report on the metaverse, cautioning that Second Life and other virtual worlds would be limited in their impact due to the present "tethered nature" of the experience. As Terdiman (2007b) pointed out, there is a danger in having virtual worlds being too "PC-centric" in a culture where increasingly people will want to take their virtual-world experience with them in their first lives. Indeed, Rawlinson (2007) observed that in our increasingly mobile society, virtual worlds will likely serve an important role to "help us hold our far-flung social networks together" (n.p.). Trevena (2007) prognosticated that "in the not too distant future, this technology will need to be everywhere and anytime, including on portable devices and phones" (n.p.).

The availability of Second Life and virtual worlds to citizens on their personal and work computers—and

soon on their mobile devices—will enable not just accessibility for the disabled and the homebound, but will likely reinvent the average citizen's ability to participate in government and engage public officials. Of course, because of the technology necessary to run most virtual-world programs, this will raise questions regarding the "average" citizen's access to broadband and high-end computing technology.

A panoply of public policy issues are raised by the need for such devices to be widely available in public places—schools, libraries, hospitals, kiosks in malls—and even in one's own home and on one's person as the technology goes mobile. Perhaps there can even be tax incentives or rebates for such purchases, such as the current digital television transition program. However, the impact of such an "architecture of participation" can be profound in a relatively short period of time, especially in our multitasking, multi-job, on-the-go lives—and more than ever as the cost of presence and participation in governmental affairs is ratcheted up with $3, $4, $5 … $10 per gallon gasoline. Simply imagine the not-so-distant future when:

- A soccer mom can tour a virtual job fair and even apply and interview for a public sector position while sitting on the sidelines of her daughter's game.

- An American businessperson can wake up in the middle of the night in Tokyo to view and participate in a local zoning board hearing concerning an ordinance that could radically affect his neighborhood back home.

- A governmental panel investigating the impact of tax legislation under consideration can gather a panel of four of the world's leading economists, all "appearing" in the hearing without having to leave their offices. And, yes, a "regular Joe" can engage in a real-time, voice-based conversation through his avatar with the avatar of a Nobel Prize–winning PhD.

Staffing

The virtual world is literally a 24/7/365 environment, and organizations must recognize and thrive with this fact. As has been shown, while it has proven helpful to schedule in-world "events" (presentations, meetings, concerts) at specific times, there must be a constancy and permanence to

one's virtual-world presence. As Zimmer (2007c) observed: "Events can be an accelerator for communications in/with these spaces and are a key component, but what if MySpace were only 'alive' between 7:00 and 9:00 twice a week? Social worlds require social commitments" (n.p.). While "bot-like" avatars can automatically greet visitors to a Second Life site, Anthes (2007) recommended that an organization's SL site should be staffed by a virtual avatar that would welcome visitors to the site and be able to answer questions and direct them to their desired locations.

Having such a virtual greeter will mean staffing the role with one or more real persons, at least during business hours. However, while this will mean dedicating *real budgetary dollars* to provide this staffing, the user experience and the organization's return on its virtual-world investment will be mutually enhanced. Hespos (2007) echoed this sentiment, stating: "While objects and signs can be programmed to offer interactive experiences that can help your customers, a fully automated presence often fails to deliver the human component that is an important part of virtual world experiences" (n.p.). Thus, agencies will need to decide how to allocate human resources to have staff available—perhaps through desktop alerts that visitors have reached their virtual-world site—to help guide them through and answer any questions they may have in-world.

Virtual-World Policies

As virtual-world technology is introduced in the public sector workplace, there will certainly be issues that will have to be addressed, as there are no norms or codes of conduct for government employees acting in the virtual world (Williams, 2008). Questions such as those below will have to be addressed by policies:

- How should their avatars look?

- Where can they go?

- What can they say?

- What can be done "on the clock"?

Right now, there are scant examples of good or even fully developed corporate, public sector, or university policies for conduct in virtual worlds. Perhaps the best example to date is IBM's Virtual World

Guidelines (IBM Research, 2007) (see the sidebar "IBM's Virtual World Guidelines" on page 36). Certainly, this is an area that will need attention going forward, as executives will want to have standards in place for what can and cannot be done in Second Life and other virtual worlds when acting "officially" and/or with one's "official" avatar.

Return on Investment for Public Sector Involvement

Finally, in government agencies at all levels, many public sector executives, like their private sector counterparts, will question the return on investment, or ROI, equation for venturing into virtual worlds at this early point in their development, considering the uncertainty, instability, and—quite frankly—bad word of mouth about what is going on in them. From the perspective of the *eGovernment Bulletin Live*: "The question remains as to whether the time is yet right for the public sector beyond the educational and research spheres to invest in creating a presence in virtual worlds that are still relatively poorly developed and relatively poorly used" (Anonymous, 2008b, n.p.). Indeed, Herman (2008) questioned, given limited resources and limited bandwidth—both managerial and technical—whether Second Life should be a priority as public sector executives consider how and when to engage in Web 2.0 projects. He observed: "The key is thus to take Second Life for what it still is, a relatively unique niche space, whose utility for engagement should be targeted on its ability to pinpoint a population of Web 2.0 savvy users, and most important, in a visual and quasi-physical manner" (n.p.).

As Dorobek (2007) observed, it will be difficult for public sector executives to see clear ROI from any foray into virtual worlds or Second Life at present. Likewise, a recent research report from Forrester concluded: "Much of the value of a Web 2.0 deployment is incremental and 'soft' in nature, and as a result, clear business value measurement remains elusive" (Young, 2007, n.p.). What kind of metrics? There are problems at present with even determining basic web-style metrics in virtual worlds, such as visitors to a specific site.

One of the reasons for skepticism about the value of virtual-world projects is the lack of reliable data about virtual worlds, which mostly comes in the form of self-reported data by the proprietors of the environments. There is also a lack of established metrics for virtual-world activities or benchmarks for success in such ventures (eMarketer, 2008). Thus, going forward, there will be a need for verifiable data on virtual worlds and activity within them. This will present what is likely a colossal market opportunity for firms seeking to become the "Nielsen Ratings" equivalent for virtual worlds and for companies that can seek to make it easier to capture quantifiable metrics from these sites.

However, if such data can be captured in Second Life and other virtual worlds, in-world metrics that should be captured by public sector organizations on their sites would include data on avatar visits, duration of visits, and demographics. Some of the more interesting data for evaluation would be avatar activities while on the agency's site, such as playing games, viewing educational videos, interacting with other visitors or agency staff, and, yes, the number of agency-logo T-shirts and coffee mugs garnered by avatars visiting the site.

Conclusion

Cory Ondrejka of the University of Southern California's Annenberg School for Communication recently predicted that virtual worlds will have lasting impact, as they represent "another step in our sort of path of improving human-to-human communication" (op. cited in Guess, 2008, n.p.). Whether or not interoperability between virtual worlds comes about, and whether or not Second Life becomes a web-like platform or fades into more or less obscurity, there is one certainty. The experience gained by individuals and organizations in virtual worlds will transfer to other environments, even if right now their digital identities and assets may not.

It is important to note that for now, experience in virtual worlds may mean various things to various people in the same organization. In fact, just going into an organization's private virtual environment to create and use an avatar will be seen by many workers, particularly those of us over 40, as a revolutionary day! So, simply establishing a virtual-world environment—public or private—in which workers, and eventually constituents, might interact is a big step. However, in time, we will see that tangible,

IBM'S Virtual World Guidelines

1. **Engage.** IBM encourages its employees to explore responsibly—indeed, to further the development of—new spaces of relationship-building, learning and collaboration.

2. **Use your good judgment.** As in physical communities, good and bad will be found in virtual worlds. You will need to exercise good judgment as to how to react in these situations—including whether to opt out or proceed.

3. **Protect your—and IBM's—good name.** At this point in time, assume that activities in virtual worlds and/or the 3D Internet are public—much as is participation in public chat rooms or blogs. Be mindful that your actions may be visible for a long time. If you conduct business for IBM in a virtual world or if you are or may appear to be speaking for or on behalf of IBM, make sure you are explicitly authorized to do so by your management.

4. **Protect others' privacy.** It is inappropriate to disclose or use IBM's or our clients' confidential or proprietary information—or any personal information of any other person or company (including their real name)—within a virtual world.

5. **Make the right impression.** Your avatar's appearance should be reasonable and fitting for the activities in which you engage (especially if conducting IBM business). If you are engaged in a virtual world primarily for IBM business purposes, we strongly encourage you to identify your avatar as affiliated with IBM. If you are engaged primarily for personal uses, consider using a different avatar.

6. **Protect IBM's and others' intellectual property.** IBM has a long-established policy of respecting the intellectual property of others, and of protecting its own intellectual property. Just as we take care in our physical-world activities to avoid infringement of intellectual property rights and to provide proper attribution of such rights, so we must in our activities in virtual worlds—in particular with regard to the creation of rich content.

7. **IBM business should be conducted in virtual environments only with authorization.** You should not make commitments or engage in activities on behalf of IBM unless you are explicitly authorized to do so and have management approval and delegations. If you are authorized, you may be asked by IBM management to conduct IBM business through a separate avatar or persona reserved for business use. You should certainly decide to use a separate avatar or persona if you think your use of an existing one might compromise your ability to represent IBM appropriately.

8. **Be truthful and consistent.** Building a reputation of trust within a virtual world represents a commitment to be truthful and accountable with fellow digital citizens. You may be violating such trust by dramatically altering your digital persona's behavior or abandoning your digital persona to another operator who changes its behavior. If you are the original creator or launcher of a digital persona, you have a higher level of responsibility for its behavior.

9. **Dealing with inappropriate behavior.** IBM strives to create a workplace that is free from discrimination or harassment, and the company takes steps to remedy any problems. However, IBM cannot control and is not responsible for the activity inside virtual worlds. If you are in a virtual environment in conjunction with your work at IBM and you encounter behavior that would not be acceptable inside IBM, you should "walk away" or even sign out of the virtual world. You should report abuse to the service provider. And as always, if you encounter an inappropriate situation in a virtual world which you believe to be work-related, you should bring this to the attention of IBM, either through your manager or through an IBM internal appeal channel.

10. **Be a good 3D Netizen.** IBMers should be thoughtful, collaborative and innovative in their participation in virtual world communities—including in deliberations over behavioral/social norms and rules of thumb.

11. **Live our values and follow IBM's Business Conduct Guidelines.** As a general rule, your private life is your own. You must, however, be sensitive to avoid activities in a virtual world that reflect negatively on IBM. Therefore, you must follow and be guided by IBM's values and Business Conduct Guidelines in virtual worlds just as in the physical world, including by complying with the Agreement Regarding Confidentiality and Intellectual Property that you signed when you became an IBM employee. It is obviously most important to do so whenever you identify yourself as an IBMer and engage in any discussions or activities that relate to IBM or its business, or use any of IBM's communications systems or other assets to participate in a virtual world.

Source: IBM Research, IBM Virtual World Guidelines. Available at http://domino.research.ibm.com/comm/research_projects.nsf/pages/virtualworlds.IBMVirtualWorldGuidelines.html.

real-world results will come from the collaboration, learning, and interactions that come about in virtual-world environments. We will also see public sector executives increasingly willing to shift financial, technology, and human resources to virtual-world projects as success stories spread and as they see cost savings and positive environmental impacts from lessening reliance on the "economy of presence."

Also, in time, we may come to regard government sites in virtual worlds as something akin to today's public buildings, libraries, or parks. They may be public "common ground" spaces in which to meet, research, collaborate, and have fun. And, yes, these areas will need rules and policies, requiring some supervision and even cyber security to enforce the standards of behavior. But these virtual public spaces should come to be regarded as safe—and dare we say fun—environments. And so, over time, the public square may take on a virtual second form. With this will come both a world of issues and a world of opportunities.

Yet the challenge has been laid down: Government should be an active participant in virtual forums. The question is how, not when, to establish a virtual presence, and what to do with it. Yes, there is great public relations value in opening a virtual-world site; the launch of a Second Life island for an agency, library, college, or tourist bureau will garner media attention and, with that, virtual visitors. But the critical question, as posed by Philip Rosedale, is: "In Second Life, you can get everything you want on the first day. What's interesting is what you do the next day" (quoted in Newitz, 2006, n.p.).

The above question can be extended to any virtual-world launch, be it a private or a public environment, as it requires a vision for recognizing that a big part of our future will be lived in 3D. Finally, as Jason Stoddard, CEO of Centric, a new media agency, remarked: "The very fact we're wandering around in virtual worlds from every corner of the globe and comparing their relative merits is hugely exciting…. It's a helluva trip" (opinion cited in Weinberg, 2007, n.p.). The future is unfolding in 3D. Will you be a part of it?

Part II: Virtual Worlds as a Social Phenomenon

Understanding Virtual Worlds

Virtual Worlds 101

"Every human being is interested in two kinds of worlds: the Primary, everyday world which he knows through his senses, and a Secondary world or worlds which he not only can create in his imagination, but which he cannot stop himself creating."

— W. H. Auden, *Secondary Worlds*

Dreaming About Virtual Worlds

The concept of virtual worlds is not new. In fact, virtual worlds have existed "ever since human beings started dreaming" (de Nood and Attema, 2006, p. 12). Thomas Leitch, professor of English at the University of Delaware, recently remarked that having a "second life" is, in fact, not a new concept brought about by today's Web 2.0 environment. In fact, there are countless examples of how "plays, novels, movies, spectator sports, board games, and television all allow people to experience second lives that are in important ways more satisfying than their own" (quoted in Greto, 2008, n.p.).

Alternative worlds have played a significant role in the realm of literature, from *The Wizard of Oz* to *Alice in Wonderland*. Most notably, they have been the centerpiece of many works of fantasy and science fiction (Steinkuehler and Williams, 2006). Alternative virtual worlds have been the focus of fictional movies ranging from *The Matrix* trilogy to *Tron*, and even Michael Jordan's trip down the golf hole to Bugs Bunny's alternate universe in *Space Jam*.

An Executive Guide for Keeping Up with the Virtual World

As virtual worlds increase in both utility and usage, it will become important for you to learn about what is going on in this "second place." So, here's a five-step plan to learn more about Second Life (see the next section for a discussion of Second Life) and the rest of the 3D Internet:

1. Join Second Life and create an avatar (be careful; pick a name that your constituents and your mom would be happy with). Teleport around to islands of various types (the governmental, corporate, university, and museum sites highlighted in this report will make for a good start.)

2. Pick at least two other virtual worlds to join and explore, depending on whether you are more of a World of Warcraft or Virtual Magic Kingdom type.

3. Ask your kids (whether they are in first grade or college) what they are doing in virtual worlds. Don't do this in an accusatory way—they might be able to teach you a great deal.

4. Ask your staff what they are doing in virtual worlds (again, not acting as the IT police). Find out who are "the experts" in your office and which staffers might be helpful in working on your agency's virtual-world project.

5. Bookmark or RSS several virtual-world news sites and/or blogs (CNN's I-Reports on Second Life and Reuters News Bureau in Second Life are great places to start). Set up a "Google Alert" for virtual worlds and government topics (you may want to focus it more narrowly on your agency type and on Second Life as well if that is your targeted venue).

Computerized virtual worlds have been featured in works such as William Gibson's 1984 *euromancer*, in which the author coined the term, "cyberspace." Likewise, the concept of a "metaverse" originated in Neal Stephenson's 1992 book, *Snow Crash*—named one of *Time* magazine's 100 best modern novels (Grossman and Lacyo, 2005). The metaverse—a virtual world inhabited by real people—is an idea that has been explored by many thinkers on the subject. Smart, Cascio, and Paffendorf (2007) defined the metaverse as: "The convergence of (1) virtually enhanced physical reality, and (2) physically persistent virtual space. It is a fusion of both, while allowing users to experience it as either" (n.p.).

In his 1992 book, *Mirror Worlds*, Yale Professor David Gelernter foresaw the development of both virtual worlds like Second Life and the information richness of Google Earth. He described a mirror world in the following manner: "The software model of your city, once it's set up, will be available (like a public park) to however many people are interested…. Each visitor will zoom in and pan around and roam through the model as he chooses" (Gelernter, 1992, p. 5).

The Online Gaming Phenomenon

According to recent estimates from market analyst DFC Intelligence (2007), the video game industry exceeded $33 billion in 2006 and is expected to reach $47 billion by 2009. Video games have become a huge part of not just the entertainment marketplace but of life today. Anyone who has kids can testify to the power of video games to entrance a child's attention for hours (and hours) upon end. And the data support casual observances of the crowds around Wii's and playing Guitar Hero, RockBand, and thousands of other games. And it is not just the preteen set. On college campuses, in coffee houses, in airports, and, yes, in office cubicles, more and more people of all ages are playing video games.

The latest eMarketer survey of the U.S. video game marketplace shows almost three-quarters of all Americans play video games of one type or another, with well over half of them not just playing games on their personal computers, game consoles, or their mobile devices, but online as well (Verna, 2008). Indeed, online gaming is exploding in popularity. As can be seen in Figure 4, although the percentage of the American population playing online video games decreases in older age groups, over half of all
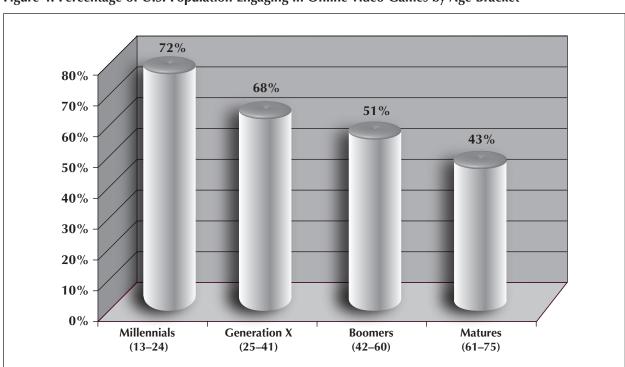
Figure 4: Percentage of U.S. Population Engaging in Online Video Games by Age Bracket

Source: Adapted from Verna (2008).

baby boomers and almost 4 in 10 members of the "mature generation" (those presently over the age of 61) play games online (Verna, 2008).

Massively Multiplayer Online Games

A November 2007 report for the Office of the Director of National Intelligence declared that "virtual worlds are the next great information frontiers" (Bush and Kisiel, 2007, p. 1). Virtual worlds are known rather synonymously as:

- MMOGs (massively multiplayer online games)

- MMORPGs (massively multiplayer online role playing games)

- MUVEs (multi-user online virtual environments)

- NVEs (networked virtual environments)

Massively multiplayer online games, or MMOGs—the umbrella term that is used in this report—can be defined as being "graphical two-dimensional (2D) or three-dimensional (3D) video games played online, allowing individuals, through their self-created digital characters or 'avatars,' to interact not only with the gaming software but with other players" (Steinkuehler and Williams, 2006, n.p.). This is the fastest growing category of online gaming, the total number of MMOG players esti-

mated to be in excess of 150 million worldwide (Varkey, 2008). In these virtual worlds, players from around the world take on fictional characters to play roles in the games.

These are labeled "massively" for good reason. Unlike a traditional computer game (which has a single player) or a home video console game (like the PS3, Wii, or Xbox, which typically has at most four players), MMOGs are likely to have many players from around the globe, perhaps even speaking different languages, engaged in the game. They commonly involve a large number of players simultaneously—hundreds and, quite commonly, even thousands. And, unlike individual video and computer games, the virtual worlds of MMOGs are persistent environments, operating on a 24/7/365, "never off" basis.

Online Games—The New National Pastime?

The largest growing segment of online gaming is among the young. According to the 2007 American Kids Survey from Mediamark Research and Intelligence (2007), nearly 4 in 5 American kids between the ages of 6 and 11 play online games, making online game play the most popular of all online activities for kids. As can be seen in Figure 5, a great
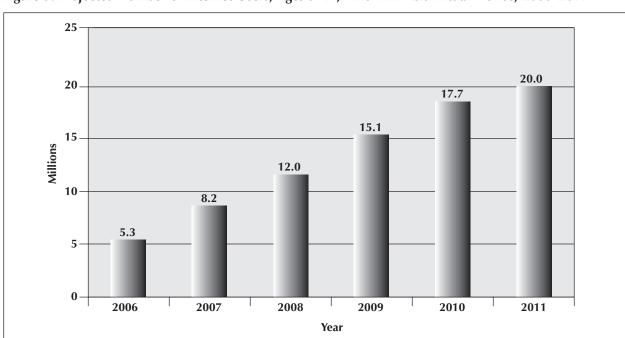
Figure 5: Projected Number of Internet Users, Ages 3–17, Who Will Visit Virtual Worlds, 2006–2011

Source data: Williamson (2007).

deal of this activity is not just with online video games, but also in online virtual worlds. In fact, online gaming has become the most popular of all online activities for today's youth—far exceeding the percentage of preteens who do any other activity, including, of course, doing "stuff for school/home-work." Anne Marie Kelly, Mediamark's vice president of marketing & strategic planning, observed that the study's findings demonstrate that "online gaming is clearly firmly entrenched as a pastime in the lives of most American kids" (n.p.).

As can be seen in Figure 6, kid-oriented virtual worlds actually dominate the American market-place. Big media and entertainment companies like Walt Disney and Viacom's Nickelodeon division are noting this trend, acquiring virtual-world sites aimed at kids (for example, Webkinz and Club Penguin) and creating virtual worlds for their theme parks, movies, and characters. Kids (or their parents) buy a physical Webkinz stuffed animal and then go online, using a code on the nametag of the animal, to adopt and care for their pet in the Webkinz virtual world. In Club Penguin, aimed at the 8-to-14-year-old set, kids can earn and buy virtual coins to clothe and house their penguin avatars in the polar virtual world (Lorek, 2007). Likewise, toy companies such

as Mattel and Lego are creating virtual worlds for children that correspond to their popular products. This burgeoning kids' market has led analysts to predict: "Forget Second Life. The real virtual world gold rush centers on the grammar-school set" (Barnes, 2007, n.p.).

While there are certainly privacy and security concerns with the growth of such online communities for the very young, they also have led exasperated parents to ask, "Whatever happened to playing with your real friends instead of ones in 2D?" (Moran, 2008, n.p.). Hof (2006) was among the first to pose questions as to what are the societal implications of having so many people spending so much time living large parts of their lives playing, interacting, and even working in virtual worlds. As Pierre M. Omidyar, founder and chairman of eBay, captured it: "This generation that grew up on video games is blurring the lines between games and real life" (quoted in Hof, 2006, n.p.). Indeed, there may be profound psychological and social issues raised by this development, which are larger issues that certainly merit continued examination going forward. Humphrys (2008) provided a cautionary note on this point, stating: "I fear a world in which children grow up believing that what matters is how many 'friends'
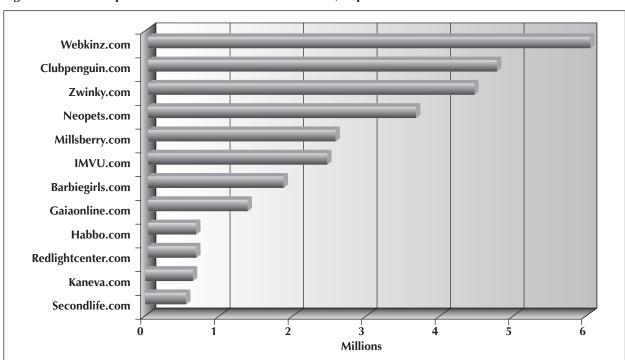
Figure 6: Total Unique U.S. Visitors to Virtual World Sites, September 2007

Table 1: Virtual Worlds for Kids and Teens

Virtual World	URL
BarbieGirls World	http://www.barbiegirls.com/
Be-Bratz!	http://www.be-bratz.com/
Club Penguin	http://www.clubpenguin.com/
Disney's Fairies	http://www.disney.co.uk/DisneyOnline/fairies/
Disney's Toontown	http://play.toontown.com/
Disney's Virtual Magic Kingdom	http://vmk.disney.go.com/
Dofus	http://www.dofus.com/
Flowplay	http://www.flowplay.com/
Lego Universe	http://universe.lego.com/en-US/default.aspx
MapleStory	http://www.maplestory.com/
Mokitown	http://www.mobile-kids.net/
Nicktropolis	http://www.nick.com/nicktropolis/
Planet Cazmo	http://www.planetcazmo.com/
Puzzle Pirates	http://www.puzzlepirates.com/
Spine World	http://www.spineworld.com/s/start
Teen Second Life	http://teen.secondlife.com/
WebbliWorld Home	http://www.webbliworld.com/
Webkinz	http://www.webkinz.com/
Whirled	http://www.threerings.net/whirled/
Whyville	http://www.whyville.net/
Xivio	http://www.xivio.com/bftq5/index.cfm
Zoodaloo	http://www.zoodaloo.com/

they have on their Internet site or in their fantasy world rather than in the real world" (n.p.).

Despite such parental and institutional concerns, today's youth are coming to see virtual worlds as one of their primary ways to interact over the Internet. According to research from Williamson (2007), the percentage of all Internet users between the ages of 3 and 17 that access virtual worlds at least once a month has risen by over 50 percent in year over year figures (from 5.3 million in 2006 to 8.2 million in 2007). And, if this trend continues, by 2011—the same year Gartner targeted as the time when virtual worlds will reach a true tipping point— well over half of all young Internet users (approximately 20 million) will visit virtual worlds.

Moreover, interacting with virtual worlds changes their perspective on what the Internet experience should be. Williamson (2007) observed: "They are growing up not only with social networking but also with the ability to interact with people, shop, learn, and play in a graphic environment" (n.p.). In comparison, "flat" websites may seem boring, paling in comparison to what they see as truly Web 2.0—a "new and improved" version of the Internet.

The Virtual-World Marketplace

The growth of virtual worlds is not just an American phenomenon. In fact, Ahonen (2008) observed that "for adults, virtuality is an acquired taste," with fewer than 10 percent of American adults having a presence in a virtual-world environment (compared with almost half of the population of South Korea) (n.p.). According to the most recent available data, there are an estimated 73 million online game players around the world today (Gaylord, 2008), with the worldwide market for MMOGs estimated to be in excess of $350 million (Zimmer, 2007a).

Table 2: Major Virtual Worlds

Virtual World	URL
AlphaWorld	http://www.activeworlds.com/
BOTS	http://bots.acclaim.com/
City of Heroes/City of Villains	http://uk.cityofheroes.com/
City Pixel	http://www.citypixel.com/
Coke Studios	http://www.mycoke.com/
Cybertown	http://www.cybertown.com/
Dark Age of Camelot	http://www.darkageofcamelot.com/
Dubit	http://www.dubitchat.com/
Entropia Universe	http://www.entropiauniverse.com/
Eve Online	http://www.eve-online.com/
EverQuest/EverQuest II	http://everquest.station.sony.com/
Faketown	http://www.faketown.com/
Final Fantasy XI: Online	http://www.playonline.com/ff11eu/
Gaia Online	http://www.gaiaonline.com/
Guild Wars	http://www.guildwars.com/
Habbo Hotel	http://www.habbo.com/
HiPiHi	http://www.hipihi.com/index_english.html
Knight Online	http://www.knightonlineworld.com
Lineage/Lineage II	http://www.lineage.com/
Runescape	http://www.runescape.com/
Star Wars Galaxies	http://starwarsgalaxies.station.sony.com/
The Lord of the Rings Online: Shadows of Angmar	http://www.lotro.com/
The Sims/The Sims2 Online	http://www.ea.com/official/thesims/
There	http://www.there.com/
Ultima Online	http://www.uo.com/
Virtual MTV	http://www.vmtv.com/
Virtual World of Kaneva	http://www.kaneva.com/
vSide	http://www.vside.com/
World of Warcraft	http://www.worldofwarcraft.com/

Virtual worlds are fast becoming an environment of choice for millions of individuals and a very big business. As can be seen in Tables 1 and 2, there are a panoply of virtual worlds online today, with hundreds more reportedly in various stages of development looking to come online in the next few years. Steve Prentice, Gartner Group's chief of research, characterized the teen virtual-world marketplace as exploding, as indeed, "there just seems to be another coming along every week" (Lorek, 2007).

Second Life is but one slice, albeit a tremendously important one, of the overall virtual-world marketplace. In fact, both in terms of population and revenue, Second Life is dwarfed in size by what Sellers (2007) aptly termed "men in tights" games—medieval-style fantasy games such as World of Warcraft, Runescape, Lineage, Ragnarok, and Everquest. In fact, in January 2008, World of Warcraft, the largest MMOG, surpassed the astonishing mark of having 10 million active subscribers—at least a quarter of whom are based in the

U.S. and Canada (Smith, M. 2008) and almost half of whom are based in China (Au, 2008b). Sarvary (2008) pronounced the metaverse the new TV (as a form of entertainment), but with the social nature of the games. Pinckard (2006) aptly asked, "Is World of Warcraft the new golf?" (n.p.).

In fact, one of the fastest growing online MMOGs is MapleStory. Far from the brutal fantasy world of the World of Warcraft, this online world is largely populated by young girls, who spend their in-world currency, Nexon Cash, on fashions for their avatars. Operated by Nexon, a South Korean firm, MapleStory is exploding in popularity in the U.S. It has an esti-mated 5 million plus American users despite having much lower-quality graphics than other video games and virtual worlds on the market today (Leonard, 2008).

Conclusion

What does all this mean and where does it lead? Bush and Kisiel (2007) declared that "the virtual world is rapidly evolving into a close representa-tion of the real world with all the opportunities and consequences of the real world" (p. 8). Harvard Business School Professor Stephen Kaufman, an expert on disruptive technologies, cautioned: "You can't tell where these things will go, and they will probably go places you'd never expect them to" (quoted in Clark, 2007). Still, Newitz (2006), writing in *Popular Science*, predicted that virtual worlds may well be "a window onto the Web's future" (n.p.).

Indeed, in the *Metaverse Roadmap Overview*, Smart, Cascio, and Paffendorf (2007) predicted that many 2D Internet activities will migrate to the 3D spaces of the metaverse. They envisage: "Although the 'Web' technically refers to a particu-lar set of protocols and online applications, the term has become shorthand for online life. It's possible that 'Metaverse' will come to have this same duality: referring to both a particular set of virtualizing and 3D web technologies, and the standard way in which we think of life online. Like the Web, the Metaverse wouldn't be the entirety of the Internet— but like the Web, it would be seen by many as the most important part" (n.p.).

Nino (2007) observed that "the web allows you to call up information. The virtual environment allows you to experience and visualize data" (n.p.). As such, virtual environments won't replace today's Internet in a wholesale manner. However, in the future, we will find the best uses of both, as tasks will migrate to and from the web and virtual worlds, wherever they are best suited.

Second Life: A Case Study of Virtual Worlds

"Once we have enough computing power, we can remake the world using simulation."

— Philip Rosedale, Linden Lab founder (quoted in Kushner, 2007, n.p.)

Overview

Writing in the *Harvard Business Review*, Reeves, Malone, and O'Driscoll (2008) differentiated Second Life from MMOGs in the following manner: "unlike online games, virtual social worlds lack structured, mission-oriented narratives; defined character roles; and explicit goals" (p. 62). In the virtual social world of Second Life, there are no quests, and there is no scripted play or top-down game plan (Sharp and Salomon, 2008). There is no embedded objective or narrative to follow. There are no levels, no targets, and no dragons to slay. It has been hailed as nothing less than the "evolution of the computer game," because rather than having a ready-made character with a fixed purpose, participants create their own avatar with an open-ended existence (Hutchinson, 2007, n.p.). Thus, unlike a Star Wars–like character or an armed rogue warrior whose mission it is to shoot as many other characters as possible or to collect enough points to advance to the next level, the Second Life avatar wanders a virtual world with the ability to "teleport"—in a "Star Trek"–like manner—from virtual place to virtual place.

Edward Castronova, author of *Synthetic Worlds: The Business and Culture of Online Games*, believes that the growth of virtual social worlds is a sign that "we have an emerging industry of people making fun things"—an "economics of fun." He added that

Second Life is itself not "fun," just as the Internet is not inherently "fun." However, there are aspects of Second Life that are indeed fun and, as such, attract a sizable number of participants (quoted in Booker, 2007a, n.p.). Justin Bovington, the CEO of Rivers Run Red, a London-based Second Life consultancy, observed: "Second Life is proof that we are entering a much more immersive era for entertainment. It offers a whole new level of experience with something that you're interested in" (op. cited in Kurs, 2007, n.p.).

Second Life has been described in myriad ways. In a *Business Week* cover story on virtual worlds, Hof (2006) described Second Life as "something a lot stranger than fiction…. Some unholy offspring of the movie *The Matrix*, the social networking site MySpace.com, and the online marketplace eBay" (n.p.). In *Fortune,* David Kirkpatrick (2007) painted an accurate visual description of Second Life as "a brightly colored, three-dimensional world that resembles Grand Theft Auto crossed with Lord of the Rings" (n.p.). Last (2007b) characterized Second Life as looking "like a cartoon rendering of the real world, or, more accurately, a cartoon rendering of Malibu" (n.p.). With avatars that are primarily young, fit, and very attractive, it has been described as appearing "like the setting of a beer commercial" (Bain, 2007, n.p.).

Muthalaly (2007) characterized Second Life in the following manner: "It's not a game. It's a platform. A place where real people come and lead virtual lives…. It's an immersive world. It appeals to people because it's not information driven, but heart driven. It's not about being informed, it's about participating" (n.p.). Second Life is not simply about participating; it's about creating. Welles' (2007a) observation about Second Life is that "everyone is audience member and player at once" (n.p.). In total,

however, "Second Life's combination of real-time interaction and physical embodiment create a space unlike anything else online" (Scola, 2007, n.p.). Zimmer (2007a) noted that Second Life "offers a microcosm of vast potential for business, commerce, marketing, and learning in this decade" (n.p.).

Second Life has been described as resembling an idealized version of the world, filled with "futuristic Blade Runner–style cities and places that resemble ancient Japan" (Kurs, 2007, n.p.). In this idealized environment, there are shopping malls, colleges and universities, museums, beaches, cinemas, and night-clubs—lots and lots of nightclubs. There are business conferences and consumer marketing events taking place in-world, as well as real university classes and other types of training sessions. There are recruitment fairs being held in Second Life, as well as "real" job interviews between employers and prospective workers. It has been described as "a messy marketplace," one "where you're as likely to see a bare-chested, rabbit-headed avatar trolling for adult-themed entertainment or vandalizing a digital store as a corporate suit leading a training session" (McConnon and Jana, 2007, n.p.).

Because participants can constantly remake their appearance, avatars tend to be idealized versions of "real people," which Rawlinson (2007) aptly described as being "all nipped, tucked, and primped to perfection" (n.p.). Indeed, the appearance of avatars in Second Life is a subject of great curiosity and controversy. People can switch gender, race, age, and even species with their Second Life avatar. And they have demonstrated a great willingness to spend money in-world for fashion to make their avatars' appearance "unique." A substantial part of the in-world economy caters to this "need," with much of the clothing and accessories available for sale in Second Life having been described as being "on the racy, 'Matrix'-inspired side" (Lavallee, 2006, n.p.).

And, yes, there's quite a bit of virtual sex going on in Second Life. Many of the most trafficked sites in the virtual world involve a myriad of R-rated activities. While many associate Second Life exclusively with sex, this is not an accurate perception. In fact, analysis has shown that less than 20 percent of the Second Life virtual world has been designated as "mature," with explicit sexual material and activity appearing in only a small subset of this space (Au, 2007a). Still,

there is almost a backlash against the freewheeling, laissez-faire atmosphere in Second Life.

There is the prospect of legislative action to restrict access to Second Life and other virtual-world sites due to the sexual content found there. Representative Mark Kirk (R-IL) has introduced legislation (The Deleting Online Predators Act, HR1120) to restrict access to social networking sites and chat rooms on computers found in public libraries and schools, which many believe could be extended to Second Life as well. In May 2008, Representative Kirk called upon William Kovacic, chairman of the Federal Trade Commission, to issue a warning to parents about the lack of age verification for access to Second Life and Teen Second Life and the dangers to children posed by the sexual content—and potential sexual predators—found in-world (Broache, 2008; Twohey, 2008). Also, it was recently announced that a Japanese firm, Transcosmos, would be opening a "G-rated," kid-friendly virtual world in an attempt to cater to the anti–Second Life market in Japan. The firm's president, Kunimasa Hamaoka, remarked: "There's total freedom to act in 'Second Life,' which requires individual responsibility. It's very American. Almost everything is OK, including evil" (quoted in Associated Press, 2007b, n.p.).

A Brief History of Second Life

Philip Rosedale, founder and CEO (until May 2008) of Linden Lab, remarked: "The intention behind Second Life was to create a world not just where a bunch of people were connected together in some way, but a world in which everything was built by us, by the people who were there in a kind of Lego block sort of way to rebuild the laws of physics" (quoted in Stout, 2007, n.p.). He had been the chief technical officer for RealNetworks in its formative days, and he was known for being an extremely creative, forward-thinking type, thinking far beyond the business of streaming audio.

The birth of Second Life can be traced to a now leg-endary night in 1999 when Rosedale and some of his friends from RealNetworks went to see the movie *The Matrix*. According to the tale, after the movie, the friends sat in a bar discussing the film and its rather dark vision of an alternate virtual reality. Rosedale announced then and there: "I'm going to build that! And it's not going to turn out that way!" (quoted in Kushner, 2007, n.p., emphasis in the

original). A short time later, Rosedale took his payout from the Yahoo buyout of RealNetworks to form Linden Lab, based in San Francisco (Joly, 2007).

Second Life was first launched in June 2003. It was unique in that it was intended to be "a platform, not a game"—and approximately a thousand users created content in the virtual environment before the site went dark due to Linden Lab funding problems. Then, in January 2004, the site was relaunched, allowing for users to own their own land (Kirkpatrick, 2007, n.p.). Since that time, the number of residents in Second Life has grown rapidly—to over 13 million in early 2008 (see Figure 7).

Participation in Second Life

John Gage, chief researcher for Sun Microsystems, describes the virtual world as "a community built entirely on participation" (quoted in Zimmer, 2007a, n.p.). Second Life has been described as a world built on a laissez-faire economy, where the invisible hand of capitalism has proven to work in the virtual environment as well. There is also a laissez-faire attitude toward many activities that could not be tolerated in the real world, which many point to as "unsustainable" (Bennett and Beith, 2007). This has been borne out by recent gambling bans and banking crises disrupting the Second Life economy.

The "laws" of Second Life's virtual world are laid out in the site's Community Standards, referred to as the "Big Six" rules. These "Behavioral Guidelines" prohibit Second Life residents from engaging in:

1. Disclosure (releasing information about the real-life person behind an avatar)

2. Intolerance

3. Harassment

4. Assault

5. Indecency (except when in private land areas rated as mature)

6. Disturbing the peace (Linden Lab, 2008b).

The primary means of communication within the Second Life environment is text-based instant messaging chat, leading experienced users to often develop typing speeds rivaling the finest executive secretary. Voice chat was introduced in Second Life in late 2007, and while some believe this to be a development that will attract more regular users to the virtual world, others feel that virtual voice can have the opposite intended effect, making users "clam up" (Dignan, 2007).

The word *avatar* has a specific historic and religious significance, taken to mean in the Hindu tradition
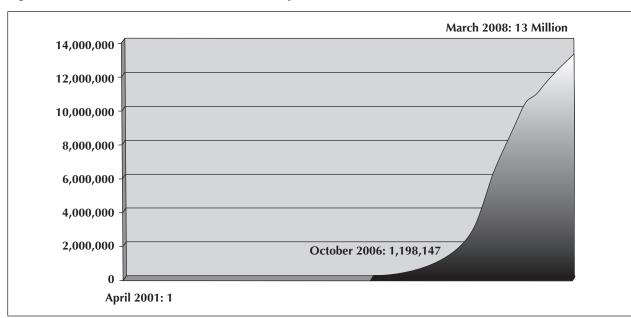
Figure 7: The Growth of Second Life's Virtual Population

Source: Linden Lab (2008a). Second Life: Economic Statistics. April 2008. Retrieved April 16, 2008, from http://secondlife.com/whatis/economy_stats.php

the physical embodiment of a divine being (Avatar, 2008). Today, Second Life is credited with bringing *avatar* into common usage, both in the United States and around the world, as meaning a digital representation of an online persona or character in a virtual world (Lee, 2007). In Second Life, people can customize the look of their avatar in myriad ways; in fact, one of the biggest in-world business categories is the sale of custom clothes and accessories for all types for avatars.

As Welles (2007b) pointed out, Second Life is not at all representative of the population as a whole. In fact, due to the need for broadband Internet connection and a fairly sophisticated computer to run the application, Second Life is populated by an overly middle-class audience with the time and money to spend in-world. The demographics of Second Life are indeed quite interesting. While the virtual world began as a majority female-user site, since 2005 the site has tended to have more male than female residents. In regards to age, since those under 18 are prohibited from entering the main Second Life grid, the user base is relatively normally distributed, with the largest age group being in the 25–34 age range. However, as can be seen in Table 3, while younger users (under the age of 35) make up almost 60 percent of Second Life's resident population, older users tend to put in a disproportionate amount of time in-world. In just the past year, the number of hours residents spent in-world has *doubled* to over 30 million hours each month (see Figure 8), and residents aged 35 and older put in approximately half of all user hours in the virtual environment.

The in-world environment of Second Life has also been accurately described as being overly white in demographic (at least in the representation of the avatars) (Welles, 2007b). While Second Life draws users from around the world, today it is, by and large, still a North American- and European-driven phenomenon. In fact, American users make up just over a third of all Second Life users, with the total number of European users actually exceeding those based in the U.S. (Riley, 2007a) (see Table 4 on page 52).

The Virtual Economy of Second Life

What has propelled the rapid growth of Second Life? Analysts point to the fact that it is an entrepreneurial, free-market-based virtual economy (Sharp and Salomon, 2008). As such, virtual worlds can be viewed as "essentially unregulated playgrounds for economic organization" (quoted in Hof, 2006, n.p.). Futurist Thomas Frey, a former IBM executive who presently serves as the executive director of the DaVinci Institute, recently observed: "I see Second Life as the next generation of social networking, but so much more. It has its own currency, land to buy and sell, and free enterprise systems that allow entrepreneurial-minded people the ability to build new countries and new kinds of business" (opinion cited in Bhartiya, 2007, n.p.). The nascent Second Life economy has been described as a "highly entrepreneurial environment," with the attendant opportunities and issues that were encountered in the early days of the web (Sharp and Salomon, 2008).

Table 3: Second Life Users by Age

Age Group	Active Avatar Count	% of Active Avatars	Total Hours	% of Total Hours
13–17*	5,524	1.01%	135,401	0.44%
18–24	126,952	23.32%	4,745,842	15.50%
25–34	192,057	35.29%	10,598,929	34.61%
35–44	129,570	23.81%	8,698,627	28.40%
45 plus	87,435	16.06%	6,314,192	20.62%
Unknown	2,752	0.51%	132,186	0.43%
Total	**544,290**		**30,625,177**	
*in Teen Second Life				

Source: *Linden Lab (2008a). Second Life: Economic Statistics. April 2008. Retrieved April 16, 2008, from http://secondlife.com/ whatis/economy_stats.php.*
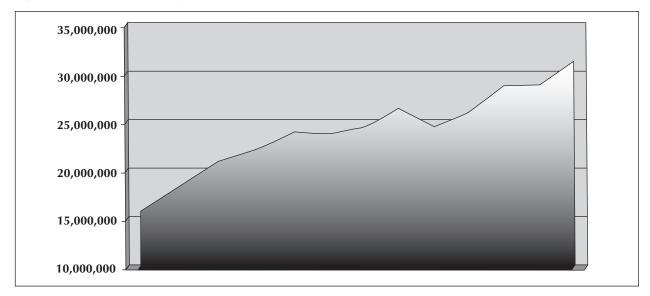
Figure 8: Total User Hours Spent in Second Life, March 2007–March 2008

Second Life has been described as a virtual laboratory for helping to better understand how both virtual- and real-world economies work: "This virtual world has become a petri dish of loosely regulated markets and has begun to pose some profound questions about the meaning of assets, currencies, and intellectual property" (Rappeport, 2007, n.p.). "Some economists might dismiss virtual worlds as an application for economics, given that they do not contain any resources that are traditionally considered scarce (lumber, steel, oil, etc.), but a closer inspection reveals that some virtual worlds contain real market economies complete with scarce resources, property rights, entrepreneurship, and exchange. Furthermore, real people underlie the inhabitants of virtual worlds, so we can therefore analyze their economies using Austrian economics and the science of human action" (Beller, 2007, n.p.). In its short existence, Second Life has proven that the "invisible hand" of the economy works reasonably well in the virtual world as well.

Beller (2007) compared Second Life's economy to that of "a small foreign country dependent on tourism" (n.p.). Like an island tourist destination in the Caribbean or Mediterranean, visitors exchange their real dollars for Linden Dollars, which they can spend while there (in-world). And, like visiting a foreign place in the real world, residents can convert what remains from their excursion to the foreign county back to U.S. dollars at the end of their stay. The size

of the Second Life economy has been estimated at $300 million or more, meaning its virtual economy is larger than the gross domestic product of some real nations, such as Dominica and Micronesia (Krangel, 2008a).

Second Life's own virtual currency—Linden Dollars—is convertible both to and from U.S. dollars, euros, and other real-world currencies. The value of the Linden Dollar is determined on the Lindex exchange, and it has roughly traded in the range of L$260 to L$280 for each U.S. dollar. Analysts have pointed out that there is more trade in Linden Dollars and exchanges between Lindens and other currencies than many real-world currencies. (Ranger, 2007a). Residents can thus build, own, and sell their digital creations, and buy those of others. Customers can buy "land" and entire "islands" in Second Life to develop as they wish. In essence, paying the upfront cost of the land and the monthly maintenance fees is a charge for the server space and operations needed to support the "virtual real estate." Still, a legitimate organizational presence in Second Life, with one's own island, has been estimated to cost less than $5,000 annually (excluding the real necessity to "staff" the island with real employees serving as virtual guides on the site) (Boyd, 2007).

The actual number of people who "make money" through their activities in Second Life is considered by analysts to be vastly overstated. In fact, Mike

Table 4: Top 25 Countries in Second Life by Active Avatar Count

Rank	Country	Active Avatars	% of Avatar Count
1	United States	194,899	35.81%
2	Germany	44,908	8.25%
3	United Kingdom	43,859	8.06%
4	France	27,130	4.98%
5	Japan	27,081	4.98%
6	Brazil	25,236	4.64%
7	Italy	23,577	4.33%
8	Canada	18,279	3.36%
9	Spain	17,868	3.28%
10	Netherlands	17,202	3.16%
11	Australia	12,245	2.25%
12	Belgium	6,053	1.11%
13	Poland	4,953	0.91%
14	Portugal	4,939	0.91%
15	Switzerland	4,196	0.77%
16	China	4,120	0.76%
17	Sweden	4,044	0.74%
18	Mexico	4,032	0.74%
19	Argentina	3,776	0.69%
20	Denmark	3,231	0.59%
21	Greece	2,249	0.41%
22	Korea, Republic of	2,241	0.41%
23	Romania	2,099	0.39%
24	Ireland	1,818	0.33%
25	Czech Republic	1,647	0.30%

Source: Linden Lab (2008a). Second Life: Economic Statistics. April 2008. Retrieved April 16, 2008, from http://secondlife. com/whatis/economy_stats.php.

Goodman, director of consumer research for the Yankee Group, proclaimed that Linden Lab's economic impact numbers were "full of holes you could drive a truck through" (quoted in Hill, 2007, n.p.).

There have been well-publicized success stories of Second Life entrepreneurs, including most notably Ailin Graef, a German citizen better known as Anshe Chung, who has become the first real-life millionaire based on being one of the largest owners of virtual real estate in Second Life (Krangel, 2007a).

Thus, the market not just for virtual real estate, but virtual products, is now a multi-billion-dollar global marketplace, conducted both in virtual worlds and in other e-commerce markets such as eBay and Craigslist. And it goes far beyond Second Life, with virtual sales of avatar goods—clothes, accessories, and, of course, weapons—thriving in World of Warcraft and other sites. There is a well-reported case of a gamer in the Entropia Universe who paid in excess of $100,000 for a virtual space station (Sharp and Salomon, 2008)! In an analysis published in the *Harvard Business Review*, Castronova (2005) estimated that in-world sales of virtual goods dwarf the external trade of such items—by 20 times or more.

A whole host of major companies have established Second Life presences, including retailers, car companies, consumer products firms, and even service providers (including H&R Block for tax help). A catalogue of major firms' Second Life sites and islands is provided in Table 5 on pages 54 and 55. For companies, the prospect of ROI in their Second Life ventures is very long term at best. As Greg Verdino, vice president of emerging channels for Digitas, concluded: "Can you, as a business, look at the Second Life of today and say it's a viable marketing channel? Can you draw direct lines between what people do in Second Life and what they do in real life? No, you can't. Certainly, Second Life is innovative, but it's far too early to start calculating return on investment, or expect any real-world deliverables to come of it" (quoted in Metz, 2007, p. 74).

Hespos (2007) recently remarked on what has been driving companies to invest in Second Life and other virtual worlds. He said: "I see FUD ('Fear, Uncertainty and Doubt') hard at work, with advertisers fearing that they'll miss out on a new way to communicate if they don't jump on the Second Life bandwagon soon. It reminds me of the early dot com land grab" (n.p.). Still, one has to be concerned that several high-profile companies have closed up their virtual-world sites in Second Life, including American Apparel (which was the first real-world major company to establish a storefront in Second Life) and Starwood Hotels (which shuttered its "Aloft Hotel" and turned over its island for use by a real-world nonprofit group) (Hemp, 2007).

However, there is indeed potential for companies to produce real-world results from their Second Life operations beyond any in-world sales. Companies can look at a variety of indirect return measures, including media mentions of their Second Life operations and potential cross-promotions aimed at in-world residents to shop in the real world (Jana and McConnon, 2006).

Virtual worlds can also be seen as a test bed for new ideas, products, and designs, as well as a forum for user-generated ideas to rise to the attention of corporate designers and marketing executives for use in real-life products and services. An example of this can be found in Toyota's Scion City, Second Life, where residents can not only configure and "drive" their own Scion, but also make customizations that Toyota will evaluate for use on the real-life version of the car, with rewards going to those in Second Life who make worthy suggestions (Stout, 2007). There have also been instances where virtual "products" have become real-world items as well. One Second Life entrepreneur developed a game he called Tringo, a cross between Tetris and Bingo. Nintendo licensed the popular in-world game for development as a real-life video game (Kirkpatrick, 2007).

Law and Disorder in Second Life

Henry Kelly (2007), president of the Federation of American Scientists, observed: "The ancient tension between liberty and order plays out as vividly in Virtual Worlds as in the real" (n.p.). One of the significant downsides to participating in Second Life is the sense of lawlessness that has largely pervaded the online world. The laissez-faire attitude that has historically prevailed is encapsulated in the observation of an anonymous person, whose avatar, Bobo Decosta, proclaimed last year: "I thought Second Life was another world where real life laws didn't apply" (quoted in Greenberg, 2007, n.p.).

Writing in *Computerworld*, Hayes (2007) cautioned organizations that while Second Life may be a virtual world, "the trouble it could cause you is real" (p. 52). Indeed, Second Life has not been immune to the intervention of real-world laws and real-world legal issues. Indeed, one of the more interesting discussions is who exactly should "police" the virtual worlds (Wade, 2007). While Second Life has drawn attention from the FBI and other agencies (on matters

such as gambling and money laundering) (McMillan, 2008), there are legal, jurisdictional, and ethical issues over pedestrian law enforcement in virtual worlds. A myriad of issues are involved when applying real-world laws to conduct in virtual worlds. Professor Beth Simone Noveck of the New York Law School, who is also the founder of the *State of Play: Law and Virtual Worlds Annual Conference*, recently observed: "People are appearing with new visual identities and likenesses, trademarked brands are appearing in virtual shop windows, and ownership of avatars [is] being settled in divorce and probate proceedings. The law is having to grapple with questions that are similar to, but not all the same as, what we've confronted in two-dimensional cyberspace" (quoted in Svetvilas, 2008, n.p.).

In Second Life, for instance, there was a threat to virtual property when, in late 2006, a program known as CopyBot allowed residents to copy any object in Second Life, including clothing, buildings, and other items that had been "bought" legitimately in-world (Carr, 2007a). And it is not just in Second Life. For instance, in December 2007, a Dutch teen was arrested for "stealing" virtual furniture from other avatars' virtual rooms in the virtual Habbo Hotel—valued at approximately 4,000 real euros (McCaney, 2007).

Felten (2005) predicted that as virtual worlds and their populations, economies, and complexities grew, "terrestrial governments" would be compelled and enticed to step in and begin monitoring the online domains. We have already seen this with the crackdown on gambling and banking in Second Life. As Professor Joshua Fairfield of Indiana University put it, "governance in the virtual world is already in place and it's the real world governance" (quoted in Dignan, 2006, n.p.).

Indeed, one of the biggest parts of the Second Life economy in its formative stage was gambling, with numerous islands devoted to satisfying people's desire to gamble their Linden Dollars in-world (Ferret, 2007). However, Internet gambling had been prohibited by the U.S. with the enactment of the Unlawful Internet Gambling Enforcement Act of 2006 (UIGEA). Under pressure from the FBI and other agencies, Linden Lab shut down all in-world casinos in July 2007, displacing a significant part of the virtual-world's economy (Worthen, 2007).

Table 5: Sampling of Major Companies in Second Life

Company	Second Life URL (SLURL)
1-800-flowers.com	http://slurl.com/secondlife/This%20Second/196/105/26
Accenture	http://slurl.com/secondlife/Accenture%20Careers/121/146/29
Bain & Company	http://slurl.com/secondlife/Bain/140/208
Bantam Dell Books	http://slurl.com/secondlife/Sheep%20island/119/24/25
Ben & Jerry's	http://slurl.com/secondlife/Ben%20and%20Jerrys/109/160/27
Best Buy	http://slurl.com/secondlife/Geek%20Squad%20Island/185/162/72
BMW	http://slurl.com/secondlife/BMW%20New%20World1/128/128/0
Calvin Klein	http://slurl.com/secondlife/Avalon/84/46/23
Circuit City	http://slurl.com/secondlife/IBM%2010/142/35/32
Cisco	http://slurl.com/secondlife/Cisco%20Systems/17/6/22
CNET	http://slurl.com/secondlife/Millions%20of%20Us/203/228/23
Coldwell Banker	http://slurl.com/secondlife/Ranchero/128/144/33
Comcast	http://slurl.com/secondlife/Comcast/16/231/22
Dell	http://slurl.com/secondlife/Dell%20Island/43/162/24/?title=Dell%20Island
Deutsche Post	http://slurl.com/secondlife/Post%20Island/10/109/49
Fiat	http://slurl.com/secondlife/Fiat%20Adventure%20I/194/87/64
Fujitsu	http://slurl.com/secondlife/FUJITSU/128/128/0
Gibson Guitars	http://slurl.com/secondlife/Gibson%20Island/14/229/34
H&R Block	http://slurl.com/secondlife/HR%20Block/113/48/37?title=HR%20Island
IBM	http://slurl.com/secondlife/IBM%20Business%20Center
ING	http://slurl.com/secondlife/Virtual%20Holland/128/128/0
Intel	http://slurl.com/secondlife/Thomson/18/93/23
iVillage	http://slurl.com/secondlife/Sheep%20Island/42/150/25/?title=iVilliage%20on%20Sheep%20Island
Kelly Services	http://slurl.com/secondlife/Kelly%20Services/128/128/0
Kraft Foods	http://slurl.com/secondlife/Food/108/96/28/?title=Food
Leo Burnett	http://slurl.com/secondlife/Leo%20Burnett/133/100/25

Michael Goodman, director of digital entertainment for the Yankee Group, declared that the impact of the gambling ban "points out some of the risk that you take in playing in a world that's trying to replicate the real world without some of the checks and balances that the real world has" (op. cited in Mello, 2007, n.p.).

Likewise, Second Life had difficulty for some time with "banks" operating in the virtual world, unfettered by real-world banking regulations, reserve requirements, and interest rates in the low single digits. In fact, it had been labeled a "Wild West"

financial atmosphere, replete with banks appearing and disappearing and with virtual bank runs (Naone, 2007).

In January 2008, in response both to government regulators and several suspect cases, Linden Lab shut down over a dozen banks that had begun operating in Second Life. This caused a virtual bank run in-world, when depositors scrambled to withdraw their Linden Dollars from "institutions," several of which were offering high rates of interest and even ATMs in the virtual world (Hulme, 2008).

Table 5: Sampling of Major Companies in Second Life *(continued)*

Company	Second Life URL (SLURL)
L-3 Communications	http://slurl.com/secondlife/Level%203/127/129/25
Manpower	http://slurl.com/secondlife/Manpower%20HQ/100/89/27/
Microsoft	http://slurl.com/secondlife/Microsoft/128/128/0
MovieTickets.com	http://slurl.com/secondlife/MovieTickets/128/80/23
Nikon	http://slurl.com/secondlife/Nikon/128/128/0
Nissan	http://slurl.com/secondlife/Nissan%20Altima/128/128/0
Penguin	http://slurl.com/secondlife/Hooper/172/149/25
Peugeot	http://slurl.com/secondlife/PEUGEOT/128/128/0
Renault (Formula 1 Team)	http://slurl.com/secondlife/ING%20Renault%20F1/86/163/23
Reuters	http://slurl.com/secondlife/Reuters/146/109/64
Samsung	http://slurl.com/secondlife/secondlife://SAMSUNG%20SDM/185/127/61/
SAP	http://slurl.com/secondlife/Silicon%20Island/183/160/40
Sears	http://slurl.com/secondlife/ibm%2010/95/32/23/
Siemens	http://slurl.com/secondlife/Siemens%20Innovation%20Connection/128/128/0
SkyNews	http://slurl.com/secondlife/Sky%20News/117/123/23
Sony	http://slurl.com/secondlife/Media/108/113/21
Sprint	http://slurl.com/secondlife/Sprint%20Center/93/102/41
Sun Microsystems	http://slurl.com/secondlife/Sun%20Pavillion/180/140
Sundance Channel	http://slurl.com/secondlife/Sundance%20Channel/44/181/38
Texas Instruments	http://slurl.com/secondlife/Texas%20Instruments/128/128/0
Thomas Cook	http://slurl.com/secondlife/Thomas%20Cook%20Island/129/131/27
Toshiba	http://slurl.com/secondlife/TOSHIBA/206/199/97
Toyota (Scion)	http://slurl.com/secondlife/Scion%20City/48/39/23
The Weather Channel	http://slurl.com/secondlife/Weather/113/5/26/
Wired Magazine	http://slurl.com/secondlife/Millions%20Of%20Us/203/228/23
Xerox	http://slurl.com/secondlife/Xerox/128/128/0
Yves Saint Laurent	http://slurl.com/secondlife/YSL/128/128/0

From the perspective of Cornell University Professor of Management Robert Bloomfield, the sudden shutdown of the Second Life banking system and the collapse of these in-world businesses reflected the fact that real-world economic principles hold true in virtual environments. He observed that the incident proves "there is not a whole lot that is fake about all this" (quoted in Sidel, 2008, n.p.). Linden Lab announced that due to both customer complaints and the intercession of concerned real-world banking regulators in the U.S. and elsewhere, it would no longer allow unchartered banks to operate in-world (Sidel, 2008).

Finally, as Terdiman (2007a) observed, taxation issues present both users and administrators of virtual worlds with potentially "huge problems." The Internal Revenue Service and Congress continue to work on taxation issues. While there are a number of nuanced and murky issues, general consensus holds that monies earned in Linden Dollars or any other virtual currency in a virtual world would be taxable income in the real world (Wong, 2007). The European Union has already begun collecting VAT (value-added taxes) on users in Second Life, with Linden Lab imposing a VAT of 15 to 25 percent, depending on their country of residence (Krangel, 2007b).

Terrorism in Second Life

"Terrorism," in one form or another, has been present in Second Life for some time. Among the terrorist incidents in-world have been bombings at the Australian Broadcasting Corporation's headquarters and the Reebok store, a shooting at an American Apparel store, and a helicopter being flown into the Nissan building. Terrorists have disrupted press conferences and even stormed the January 2007 meeting of the World Economic Forum in Second Life (O'Brien, 2007). The difference between terror in Second Life and real life is that the damage, both personal and structural, is not lasting; in fact, it can be reversed by a refresh of the setting. Thus, terror in the virtual world comes more in the form of "griefing"—which is all-encompassing term for anti-social, malicious, and irritating behavior that takes place between avatars. Despite efforts by Linden Lab since mid-2007 to crack down on what it terms "broadly offensive behavior," businesses continue to cite stories of griefing and terror as a huge deterrent to investing real dollars in the virtual world (Worthen, 2007).

Indeed, actual "virtual terrorist groups" exist in-world, most notably the Second Life Liberation Army, an anonymous group of virtual residents who are demanding greater property rights in Second Life. Still, as Jenkins (2007) observed, such malicious, irritating, and annoying behaviors of a few participants may simply be the "price of openness" found in the virtual worlds, comparable to the problems with hacking and viruses encountered on the web today.

Many observers believe, like Hayes (2007), that "most of the stories you hear about 'virtual terrorism' is really a toxic combination of unprepared companies in-world and the media that likes to find 'an angle,' just like the real world" (n.p.). Nevertheless, real-world terrorists' use of Second Life and other virtual worlds is quite concerning. Both inside and outside of the intelligence community, experts have speculated that virtual worlds will be conducive for real-world terrorist groups to recruit, organize, and even simulate possible attacks.

Rohan Gunaratna, author of *Inside Al Qaeda: Global Network of Terror* and associate professor at Singapore's S. Rajaratnam School of International Studies, recently commented that Second Life "is a space that is of high interest for a number of organizations, including the jihadists … [and] they are interested in knowing about the opportunities in Second Life." An anonymous senior intelligence official was quoted in the Washington Post as fearing that Second Life was ripe for terrorism, saying that "virtual worlds are ready-made havens" (cited in O'Harrow, 2008, n.p.). While some in the CIA have proclaimed that such activity will be impossible to monitor and track due to the relative anonymity of today's virtual environments, others have declared it possible, albeit very difficult (Shepherd, 2008).

In February 2008, the Office of the Director of National Intelligence released a report on data-mining activities in the intelligence community. It contained details regarding the Reynard project, announcing: "The cultural and behavioral norms of virtual worlds and gaming are generally unstudied. Therefore, Reynard will seek to identify the emerging social, behavioral, and cultural norms in virtual worlds and gaming environments. The project would then apply the lessons learned to determine the feasibility of automatically detecting suspicious behavior and actions in the virtual world" (p. 4). The Reynard project will be conducted on an unclassified basis in public virtual-world environments. It is expected to commence with observational research aimed at establishing baselines for behaviors in virtual worlds (Singel, 2008).

Are such fears justified? Cole (2008) points out that the very unreliability of Second Life will be a detraction for Al Qaeda and other terrorist groups, just as it is a deterrent for other major companies and organizations to make use of the platform. Cole (2008) expressed his belief that the hyperbole over the potential use of Second Life and other virtual worlds by terrorist groups is unreasonable and that it only serves to fan the fears and unease about the Internet in general among what he terms "the Great Unwired" (n.p.). Others feel that virtual worlds such as Second Life provide terrorists with an anonymous arena in which to swap information—and even funds, as virtual-world currencies can be potentially used to move money around the globe in a relatively hard-to-detect manner (McMillan, 2008). The virtual environment also provides terrorists with a virtual proving ground in which they can potentially rehearse potential plots and coordinate their actions, much like government agencies are looking to use such virtual-world environments for training for their *responses* to such terrorist incidents.

Terrorism in Second Life *(continued)*

Still, as Roderick Jones, head of the private intelligence practice of Concentric Solutions International, has astutely warned: "Terrorists are early adopters of technology" (op. cited in McMillan, 2008, n.p.). Thus, the terrorist threat coming from inside virtual worlds like Second Life must be closely monitored, and cooperation between governments and virtual-world platform companies—principally Linden Lab—will indeed be key. This was pinpointed in the findings of the most comprehensive, publicly available study on the use of Second Life by and for terrorists carried out to date. In May 2008, researchers at the Institute for Intelligence Studies at Mercyhurst College (2008) released the findings of *The Virtual Jihad Project* (with fascinating details on their project available at https://secondter.wikispaces.com/). These researchers concluded:

> Jihadists are likely currently very minimally using Second Life (SL) due to a very limited amount of jihadists being found on SL and broadband requirements in the Middle East and Africa limit the amount of jihadist use; however, over the next 12–24 months jihadists will likely begin to explore the ability and utility of the virtual world's applications for money laundering, communication, and recruitment through propaganda due to anonymity of use, the ability to transfer money, and the ability to communicate in different languages. Use will likely be limited to merely exploring due to currently existing alternatives such as web forums and hawalas [a money transfer system commonly found in Islamic cultures]. Jihadist SL use will likely be limited to mainly Western Europe and the United States due to the lack of ready access to broadband internet and internet restrictions in the rest of the world. The most effective countermeasure will likely rely on a close, working relationship with Linden Labs due to the systems in place to monitor financial transactions, avatar activity, and communication (n.p.).

Problems with Second Life

Second Life has been categorized as a virtual environment that is:

- "Very crude and bumpy"

- "Not fully baked"

- "Not ready for prime time" (Cummins, 2007; Trevena, 2007, n.p.).

While there are a multitude of issues that hinder—and often repel—users from Second Life, as we have seen, many have proclaimed this virtual environment as the very future of how we will navigate, search, interact, shop, and live on the web. The technical issues are considerable, including the need for sophisticated, high-end personal computers and laptops with the necessary processing speeds, memory, and graphic capabilities to handle the software.

Graphic quality is a huge issue for virtual worlds in general, and even more so for Second Life. User expectations for the realism of graphics have vastly increased over the past few years, especially in light of the photorealism found in console games and animated movies (Kelly, H., 2007). One of the intractable problems with Second Life is latency, as the graphics must be continually re-created in real time to match users' avatars to the situation into which they are projected. As Carr (2007b) observed: "If in five years, the Second Life experience is as good as watching the movie *Shrek*, there will be uses for it that we don't understand yet" (n.p.).

Second Life user experiences range the gamut, as some people spend many hours a day in-world (and a number are even married in Second Life to partners who are not their partners in real life) (Evans, 2007). There is a core of extremely heavy users of Second Life, largely composed of those who are "running" in-world businesses and, yes, those who are living a significant part of their lives in the virtual world. Estimates in 2007 pegged the "hard core" number of Second Life users at approximately 100,000 (Withers, 2007). Over all, however, the site is incredibly "sticky," as the metrics show that active users of Second Life spend approximately 45 hours a month in-world, as opposed to 10 hours a month for social networking sites such as Facebook and MySpace (Au, 2007b).

On the other hand, the majority of Second Life's residents do not "reside" there for long, with most dropping out less than a month after registering for the site. As Last (2007b) noted: "It's difficult to think of a world-changing innovation that was discarded by 90 percent of its early adopters" (n.p.). Rather

than the over 13 million residents that Linden boasts of, the "real" number of active, unique residents is closer to 550,000—or roughly the population of Portland, Oregon, as opposed to the entirety of metropolitan New York or Mexico City (Au, 2007b).

Recent analysis of economic activity in Second Life shows that while new registrants have slowed somewhat, the core user group is more highly engaged than ever, spending more money per capita. This suggests that even as new resident growth has slowed a bit, the "highly engaged base of Second Life users is intensifying its interest in the virtual world" (Krangel, 2008a, n.p.). While at present, server capacity restrictions permit upwards of 60,000 users to be in Second Life simultaneously, this is likely to change radically in the coming years in all virtual worlds as server capacities increase and a more distributed architecture is adopted.

Recent analyses of Second Life have proclaimed that major corporate sites in the virtual world are eerily empty, making Second Life appear to be more of a "ghost town" than an Internet boomland (Miller, 2007). The novelist William Gibson recently commented on the emptiness and isolation that is much of Second Life. In response to a question on his views of virtual worlds and Second Life, Gibson (2007) retorted: "So far they aren't the vision I had. I don't think I'll enjoy them much until it's possible to have hundreds of avatars actively inhabiting a single corner of virtual space. Without crashing the server, that is. Whenever I have call to go to SL, I feel as though I'm visiting a mall in Calgary on a Sunday night" (n.p.).

In fact, Michael Donnelly, head of interactive marketing for Coca-Cola's worldwide operations, described his explorations of Second Life as scary, due to the fact that at each of his visits to major company sites, "there was nobody else around." And, when Donnelly went to Starwood Hotel's Aloft Hotel prototype in Second Life (since closed), he reported: "I felt like I was in *The Shining*" (quoted in Rose, 2007). And, with such small numbers of active users on Second Life, as opposed to larger virtual worlds (such as the World of Warcraft) and especially in comparison with social networking (such as MySpace and Facebook) and user-generated video sites (such as YouTube), many analysts believe that "the value proposition just doesn't add up for U.S.-

based business" (Riley, 2007a). Indeed, Last (2007b) observed that for many companies at present, there is no value to being in Second Life "other than to be able to say they are in Second Life" (n.p.).

Second Life has been characterized as being a victim of what Shirky (2006) called the " 'Try Me' virus." He explained: "Reports of a strange and wonderful new thing draw the masses to log in and try it, but whose ability to retain anything but a fraction of those users is limited. The pattern of a Try Me virus is a rapid spread of first time users, most of whom drop out quickly, with most of the dropouts becoming immune to later use" (n.p.).

Wilson (2007) declared that much of the reason residents are quite transient in Second Life, not staying active in the environment, is the fact that virtual worlds are "prohibitively complicated," with a high, almost insurmountable, learning curve for new users. In fact, Christopher Collins, a senior analyst for The Yankee Group, warned that while "the people that are active there tend to be very active," the majority of new residents in Second Life report being "frustrated, confused and don't find it immediately compelling" (quoted in Shields, 2007, n.p.). Second Life is also hampered by the fact that without a plot or narrative to follow and without worlds and levels to conquer, there's the big question of what people should do—or can at least easily find to do—when they get there (Rose, 2007). Carr (2007b) reported that what repels many first-time visitors to Second Life is the very lack of plot, levels, or directions. He compares the new user experience in the virtual world to being a visitor to a foreign country, not knowing where one is or what to do, not knowing the language, and not understanding the culture.

Why do residents leave? One of the principal reasons is certainly the instability and unpredictability of the Second Life software. Despite intense efforts by Linden Lab to improve the user interface and experience, roughly one out of every five user sessions ends in a crash, and the entire site is often unavailable due to system downtime and/or scheduled maintenance. Further, a user's avatar can end up sinking through the virtual floor of a space or suddenly appearing in an entirely different venue than the one intended. Also, due to the need to re-create the environment for each unique user,

there is a distinct slowness to the Second Life interface, commonly referred to as "lag."

Reviewing Second Life for *Computerworld*, Anthes (2007) observed: "The user interface is slow, clunky and primitive, at least compared with what's available in the best computer games today. Graphics are flat and poorly nuanced, and image downloads would try the patience of Job" (n.p.). Second Life is also hard to navigate between the islands, and the search functionality is quite limited and has been described by analysts as "rudimentary," relying on keywords with little to no contextual utility (Terdiman, 2007b). Still, as Terdiman (2007c) pointed out, those who do stick around the Second Life site do so in spite of these seemingly intractable technical issues.

Looking ahead, these technical, operational, and user issues will be a major challenge to the future stability and success of Second Life, and with it, the future of virtual worlds as a whole. They will need to be confronted by Linden Lab's new CEO, Mark Kingdon (Krangel, 2008b).

How Virtual Worlds Are Being Used in Other Sectors

In this section, we examine how a variety of institutions beyond the governmental and corporate realms are making use of virtual-world environments in novel ways. These include:

- Libraries

- Museums

- Colleges and universities

- The media

Libraries

Libraries of all types, including archives and records repositories, may be some of the most natural agencies—at the federal, state, and even local levels—to establish and exploit a virtual- world presence. By extending their reach into the virtual world, libraries can share their holdings and connect with students/patrons in new and exciting ways. Numerous college and university libraries, including Harvard and Stanford, have established presences in-world.

"Best practice" exemplars for libraries operating in Second Life include the following:

- In December 2006, the State Library of Kansas established its virtual branch in Second Life (viewable at http://slurl.com/secondlife/cybrary city/194/67/24/), offering services such as genealogy and government documents, as well as information on the state (Sowers, 2007).

- In Nebraska, the state's library commission established its presence in Second Life in May 2007. The Nebraska Library Commission exhibit includes both interactive displays on the state and links to additional resources outside of Second Life (viewable at http://slurl.com/secondlife/Cybrary%20City/233/217/24/?title=Nebraska%20Library%20Commission). Cornwall (2007) observed that such "museum type displays are going to be natural for virtual worlds like Second Life" (n.p.).

- In November 2007, the Cleveland Public Library opened in Second Life (http://slurl.com/secondlife/Cleveland%20Public%20Library/128/128/0). The physical library in Ohio has one of the world's largest collections of historical chess-related items. In Second Life, there is a large, interactive display of these items, and the library has held several chess-related contests and events in-world (Vesta, 2007).

- Ireland's University College Dublin (UCD) opened its branch library in Second Life in 2007 (viewable at http://slurl.com/secondlife/Cybrary%20City/50/215/23). Cathal McCauley, who was the leader of UCD's library project, observed that the jump to the virtual world was a natural extension of the way libraries operate in today's environment: "We've had instant messaging and blogs for quite some time now so we thought that this virtual world might offer another useful complement to the provision of traditional library services" (quoted in Boran, 2007, n.p.).

Museums

When visitors go to any museum, they are visiting a virtual reality. That Monet painting was not created to be displayed in the National Gallery. That Civil War uniform was not created to be worn by a mannequin under glass. That lunar rock, that ancient Roman coin, that copy of the Declaration of Independence—all are housed in a museum, and a museum

is a collection of things. As John Tolva (2005) of IBM noted: "All museums are places of technologically enhanced representation. At its most fundamental level, a museum is a place for the re-presentation—the presenting again—of something created, used, or identified with someplace else" (n.p.).

Thus, one of the more exciting applications for virtual worlds is the ability of museums, galleries, and other institutions to offer virtual tours of their facilities and holdings. In Second Life, there are numerous examples of such exhibits (see Table 6), many by recognized facilities and many more simply posted by independent artists seeking recognition and an audience for their work (Urban, Marty, and Twidale, 2007). Traditional "brick and mortar" museums face ever-increasing costs and competitive pressures; some have even questioned the viability

of these institutions (Garreau, 2007). Yet, virtual worlds hold the possibility for museums, along with landmarks, parks, and memorial sites, to be replicated in Second Life or other virtual worlds to expand their reach and accessibility.

It will become increasingly important for governments themselves to take the initiative and develop such sites, either alone or together with private partners. In the absence of "officially authorized" efforts by museums or other similar facilities, private efforts will bubble up in virtual environments. For example, to demonstrate its capabilities, a privately held consulting firm, Meme Science, LLC, has replicated the Vietnam Veterans Memorial in Second Life (http://slurl.com/secondlife/The%20Wall/36/30/24) (Argus, 2007). The Second Life virtual memorial is a highly detailed representation of the real memorial on the

Table 6: Sampling of Museums in Second Life

Institution	Second Life URL (SLURL)
Artsplace	http://slurl.com/secondlife/Pak/109/41/102/?title=ArtsPlace%20SL
Bolinas Museum of Art	http://slurl.com/Bolinas/130/107/66/
Computer History Museum	http://slurl.com/secondlife/Info%20Island%20II/225/51/23/?title=SL%20Computer%20History%20Museum
Crescent Moon Museum	http://slurl.com/secondlife/Taber/198/97/21/?title=Crescent%20Moon%20Museum
Fort Malaya History Museum	http://slurl.com/secondlife/Ocean%20Pines/135/155/22/?title=Fort%20Malaya%20Malay%20History%20Museum
International Space Flight Museum	http://slurl.com/secondlife/Spaceport%20Alpha/48/75/22/?title=International%20Spaceflight%20Museum
Museum of Contemporary Art at Neufreistadt	http://slurl.com/secondlife/Neufreistadt/189/135/180/
National Holocaust Museum	http://slurl.com/secondlife/Cuscus/59/144/90/
Paris 1900	http://slurl.com/secondlife/Paris%201900/9/174/16/
Phoenicia Center for Contemporary Art	http://slurl.com/secondlife/Egrement/112/65/34/
Second Life Historical Museum	http://slurl.com/secondlife/Phobos/216/166/32/?title=SL%20Historical%20Museum
Second Louvre Museum	http://slurl.com/secondlife/Tompson/153/96/100/?title=The%20Second%20Louvre%20Museum
Sci-Fi Museum	http://slurl.com/secondlife/Indigo/75/213/22/
Science Center	http://slurl.com/Info Island II/97/206/24
'Splo (Exploratorium)	http://slurl.com/secondlife/Midnight%20City/178/54/26/
Star Trek Museum of Science	http://slurl.com/secondlife/Ocean%20Pines/37/215/25/?title=Star%20Trek%20Museum%20of%20Science
Xibalba Maya Museum	http://slurl.com/secondlife/Info%20Island%20II/41/217/24/

National Mall in Washington, D.C. A number of virtual events have been held at the site to bring together veterans and their families in-world. More details on the virtual memorial are available at http://www.thewallsl.com/.

Colleges and Universities

It's 9 a.m. Rather than driving 50 miles in traffic to attend your "Principles of Management" class in person at the university, you simply grab a cup of coffee (in your kitchen) and log in to Second Life on your home computer. You've already saved a fistful of cash—from not having to fill up your car and not grabbing that $4 latte at Starbucks on the way. Your professor is at the front of the virtual classroom, but in reality, he is simply online at his campus office. Twenty classmates walk—and some fly—into the virtual classroom. "Class" begins, and much is the same as if you were really there in real life: You hear the professor's lecture, you see the PowerPoint slides, you watch the video clip, and you instant message your friends in the class—mostly about "stuff," but occasionally about today's topic on motivation. "Class" adjourns officially, but you stay around and chat, both with text and voice, with the members of your group project team. You and they decide to "fly" to the campus virtual library to do some research on your project—and to take advantage of the free virtual coffee!

In Second Life, professors can deliver lectures "in a more interactive way" to students than ever before (Boran, 2007, n.p.). In the virtual environment, instructors can combine a variety of elements— voice lectures (live or podcast), PowerPoint slides, notes, videos, displays, interactive games, etc.— to increase engagement and enhance the learning experience. As Calongne and Hiles (2007) envisaged: "Education in Second Life shifts from the traditional classroom layout and dynamics to the opportunity to leverage the benefits of a multisensory learning environment where students can be part of the system that is being studied" (n.p.).

Early in 2007, Insead became the first business school to open a campus in Second Life, holding both classes and recruiting events in-world (Bradshaw, 2007). Today, well over 300 colleges and universities have an official presence in Second Life, with online classes being conducted in almost

every field, even law and medical school training (Joly, 2007) (see Table 7). In fact, both legal education, led by the Harvard Law School, and medical school training is developing rapidly in the virtual environment despite the hesitancy of many. As Dickson (2007) remarked, "the thought of medical gurus tinkering about in Second Life just seems wrong somehow" (n.p.).

Quite simply, the equation for colleges and universities today is exceedingly simple. As Tim Siftar, Drexel University information services librarian, put it bluntly: "We want to be where the students are, where the learning is" (quoted in Stuhldreher, 2007). Virtual worlds are a natural extension of the growth of distance and on-demand learning in colleges and universities. In fact, they can be used to overcome the isolation experienced in most distance learning environments. As Chris Collins of the University of Cincinnati recently observed: "One of the complaints that students of distance learning programs have is that they feel isolated. All of us who are involved in Second Life now realize how much of a benefit it is to be able to visualize another person. Even if it isn't an exact replica of the person you get that sense of co-presence. And that carries across to collaboration and research" (Booker, 2007b, n.p.).

The success equation for colleges and universities, however, is not as simple as a twist on the famous *Field of Dreams'* line, "If you build it, they will come." Indeed, as Gerri Sinclair, executive director of the Masters of Digital Media Program at Vancouver's Centre for Digital Media, stated: "Building an effective educational environment in SL [Second Life] is very intensive in terms of time and human capital requirements, and it is by no means cheap" (quoted in Joly, 2007, n.p.). There will also be some institutional reluctance to embrace the technology. Some professors may indeed fear that the rise of the virtual environment may mean, as Professor Ed Lamoureux of Bradley University commented, "that we're not needed anymore" (quoted in Guess, 2008, n.p.).

Finally, in Louisiana, the state is looking to Second Life as a way not just to promote virtual learning in "normal circumstances," but as a way to ensure continuity of operations and coordination in the case of a natural disaster or other emergency that

Table 7: Sampling of Colleges and Universities in Second Life

Institution	Location	Second Life URL (SLURL)
Bowling Green State University	Bowling Green, OH	http://slurl.com/secondlife/Bowling%20Green%20State/117/179/26/
Clemson University	Clemson, SC	http://slurl.com/secondlife/Clemson%20University%20GS/25/11/43
Columbia College (Chicago)	Chicago, IL	http://slurl.com/secondlife/I%20AM%20Columbia/128/128/0/?title=I%20AM%20Columbia%20Isle
Georgia State University	Atlanta, GA	http://slurl.com/secondlife/Five%20Points/115/144/26
Great Northern Way Campus–Centre for Digital Media	Vancouver, BC, Canada	http://slurl.com/secondlife/University%20Project/150/84/23/
Harvard University	Cambridge, MA	http://slurl.com/secondlife/Berkman/105/74/35
Massachusetts Institute of Technology	Cambridge, MA	http://slurl.com/secondlife/MIT/51/35/23/?title=Massachusetts%20Institute%20of%20Technology
New York City College of Technology	Brooklyn, NY	http://slurl.com/secondlife/CityTech/128/128/30
New York University	New York, NY	http://slurl.com/secondlife/Outreach/61/72/26e
North Carolina State University	Raleigh, NC	http://slurl.com/secondlife/NC%20State%20Wolflands/102/119/22
Northern Illinois University	DeKalb, IL	http://slurl.com/secondlife/Glidden/144/176/33
Ohio University	Athens, OH	http://slurl.com/secondlife/ohio%20university/20/36/24/
Penn State University	State College, PA	http://slurl.com/secondlife/Penn%20State%20Isle/120/131/41
Princeton University	Princeton, NJ	http://slurl.com/secondlife/Princeton%20University/143/148/24
Rice University	Houston, TX	http://slurl.com/secondlife/Owl%20Land/128/56/26
San Diego State University	San Diego, CA	http://slurl.com/secondlife/Meadowbrook/128/128/0
San Jose State University	San Jose, CA	http://slurl.com/secondlife/SJSU%20SLIS/128/128
St. John's University	Queens, NY	http://slurl.com/secondlife/Emgeetee/128/84/23
Tufts University	Medford, MA	http://slurl.com/secondlife/UEPP%20Tufts/130/135/29
University of Kansas Medical Center	Kansas City, KS	http://slurl.com/secondlife/KUMC%20Isle/128/128/0
University of Notre Dame	South Bend, IN	http://slurl.com/secondlife/Sophia/136/121/23
University of Southern California	Los Angeles, CA	http://slurl.com/secondlife/IML/128/129/52
University of Wisconsin–Oshkosh	Oshkosh, WI	http://slurl.com/secondlife/Wisconsin%20Tecne/128/128/0

might disburse students, faculty, and staff, as happened with Hurricane Katrina in 2005. To that end, the state has bought five islands in Second Life as part of a virtual campus initiative. Merrill Johnson, professor of geography at the University of New Orleans, stated: "If there were another disaster like Katrina, this would be a first resort. The virtual campus would still be intact. Even though students might be in Maine, California, and Texas, they could still gather in the virtual conference room and have some real-time communication" (quoted in Graves, 2008, n.p.).

The Media

Finally, virtual worlds—most notably Second Life— are becoming "mainstream" in the media, as artists and media companies find the virtual world to be both a setting for real news and fictional storylines, as well as a marketing opportunity. The news media today are not just reporting on Second Life; they are reporting directly *from* Second Life. The Reuters news agency has embedded a reporter in-world for over three years. Adam Pasick (aka Adam Reuters) calls Second Life "a reporter's dream beat" with all the unique developments that occur in-world (quoted in Steel, 2006, n.p.). In November 2007, CNN launched a bureau in Second Life, a virtual version of its "I-Reports," whereby Second Life residents routinely submit their news stories and photos of in-world news and events (Shields, 2007).

Musicians and authors have found Second Life to be an exciting new venue for presenting themselves and their work. Well-known musical artists, such as Duran Duran, Suzanne Vega, the Pet Shop Boys, and U2, along with a whole host of wannabe stars, see Second Life as a way to expose listeners to their music and to connect with their fans (Cutlack, 2007). In-world concerts with live performances by the virtual avatars of real-world acts are becoming everyday events (Knight, 2007). Such events allow artists and their fans to have uniquely intimate connections— and spark downloads, sales, and concert attendance that can make the musicians "real" dollars. Real-world authors have held "virtual readings" and book releases in Second Life, and aspiring writers have posted their stories and poems in-world to share with others in the virtual community (Haegele, 2007).

Second Life and virtual worlds are now becoming part of plot lines on television. In the fall 2007 television season alone, characters from both *CSI: New York* and *Law & Order: SVU (Special Victims Unit)* have entered virtual worlds as part of their crime-solving techniques (Ryan, 2007). Likewise, in an episode of NBC's *The Office* aired in October 2007, the plot revealed Dwight Schrute (Rainn Wilson) to be "a Second Life addict." In the episode, Dwight explained to a co-worker, who spotted him playing the game in his cubicle: "Second Life is not a game. It is a multi-user virtual environment. It doesn't have points or scores; it doesn't have winners or losers"— to which his co-worker sharply retorted, "Oh, it has losers" (McCarthy, 2007, n.p.).

Appendix: Research on and in Virtual Worlds

From the perspective of Professor Edward Castronova, research will in time become one of the primary products of virtual worlds, as "we're building petri dishes for social science" with environments such as Second Life" (quoted in Gaylord, 2008, n.p.). In the same vein, Giff Constable, COO of Electric Sheep, foresees that "social analysts will have a field day with this [virtual worlds] for the next 30 years" (op. cited in Cummins, 2007, n.p.).

Virtual worlds can be, both intentionally and unintentionally, used for research. In the latter regard, perhaps the best example to date comes from World of Warcraft. In September 2005, game administrators unleashed a disease known as "Corrupted Blood" into the game. The disease was intended to be a hindrance to high-level players as they battled a powerful creature named Hakkar. However, the infection quickly spread by characters moving throughout the game (as in a real-life epidemic), causing an uncontrolled, game-wide pandemic. The "Corrupted Blood" episode was recently analyzed by Lofgren and Fefferman (2007) in *The Lancet Infectious Diseases*, showing the lessons that could be learned by real-world epidemiologists and health professionals from the disease outbreak that occurred in this virtual world. As Blue (2007) commented, virtual worlds may thus be a safe environment to test hypotheses about how to react to real-world health and other emergencies, putting avatars—not humans—at risk.

Going forward, there will be vast opportunities to perform unprecedented types of research into the unprecedented types of interactions found in virtual worlds. Consider the case of the Comers. This Philadelphia couple, Ron and Suzanne Comer, both spend a great deal of time in Second Life. Recently,

it was reported that when both spouses are in-world, Suzanne will routinely tell her husband—in Second Life—that dinner is on the first-life dining table in their real home, even though they are just feet apart (Stuhldreher, 2007). While this may be a case for Dr. Phil—or Jerry Springer—it also highlights the issues involved as virtual life intersects with real life.

Thus, there will be opportunities to conduct research into everything from how the economics of these environments work (or, alternatively, don't work) to the nature of social interactions and communications in-world. There will also be opportunities to study the myriad ways of existing, communicating, and interacting in mixed realities. What does this mean for work relationships, for family relationships, and for one's own psyche and well-being? Indeed, Dell (2008) chronicled emerging research showing that one's online persona can carry over to real-world behaviors. In-world activities can also pay positive health dividends for the real person behind the avatar. Indeed, studies have shown that individuals having their avatars exercise in the 3D virtual world are more likely to engage in exercise in real life.

In short, as can be seen in Figure A.1 on page 66, there are vast opportunities for academic research on and in the 3D Internet. This will touch upon a wide number of fields, with great potential for cross-disciplinary research into the multidimensional aspects of virtual worlds. Such fields will include business and public administration, marketing, economics, psychology, sociology, computer science, and philosophy.

In the public administration realm specifically, it will be fascinating to chronicle not just the development
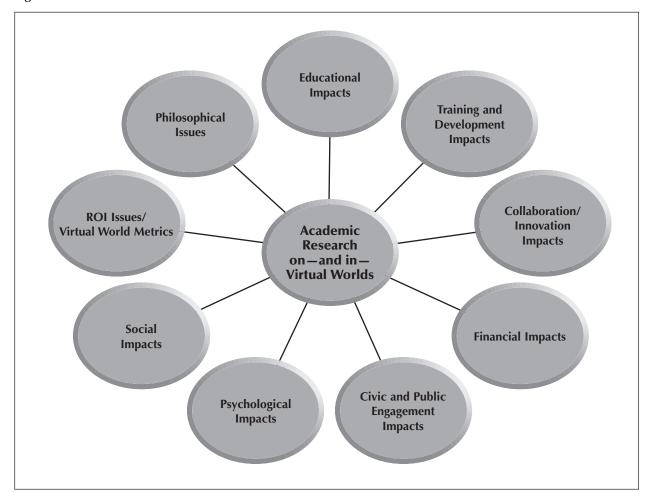
Figure A.1: Areas for Academic Research on—and in—Virtual Worlds

of governmental operations in virtual-world environments, but to examine the wider impact of a government's virtual-world presence and its overall e-government strategy. Likewise in the business realm, it will be of great interest to examine the impact virtual worlds have on a variety of activities including marketing, advertising, recruiting, collaboration, and new business/venture formation.

References

Ahonen, Tomi T. (2008). Ten related trends for 2008. *Communities Dominate Brands,* January 4, 2008. Retrieved January 6, 2008, from http://communities-dominate.blogs.com/brands/2008/01/ten-related-tre.html.

Aitoro, Jill R. (2007). Uncle Sam Gets A (Second) Life. *CMP Channel*, May 8, 2007. Retrieved August 26, 2007, from http://www.crn.com/showArticle.jhtml?articleId=199400068.

The America's Army Game Leadership Team (2008). *The making of America's Army*. Retrieved May 3, 2008, from http://www.americasarmy.com/intel/makingof.php.

Anderton, John (2007). CDC in Second Life. *USA Services Intergovernmental Newsletter*, Issue 20 (Fall 2007): 37–38.

Anonymous (2008a). Second Life feature part 2: Welcome To 'Mixed Reality.' *eGovernment Bulletin Live*, March 18, 2008. Retrieved March 20, 2008, from http://www.headstar.com/egblive/?p=95.

Anonymous (2008b). Second Life feature part 1: University of Second Life. *eGovernment Bulletin Live*, March 18, 2008. Retrieved March 20, 2008, from http://www.headstar.com/egblive/?p=93.

Anonymous (2008c). On the Net lies second Astana. *CNews*, February 29, 2008. Retrieved March 4, 2008, from http://www.cnews.kz/news/top/index.shtml?2008/02/29/104460.

Anonymous (2007a). Congressman participates in Climate Change Conference via Second Life. *GamePolitics.com*, December 13, 2007. Retrieved December 21, 2007, from http://gamepolitics.com/2007/12/13/congressman-participates-in-climate-change-conference-via-second-life/.

Anonymous (2007b). U.S. Army creates video game squad. *GamePolitics.com*, December 12, 2007. Retrieved December 18, 2007, from http://gamepolitics.com/2007/12/12/us-army-creates-video-game-squad/.

Anonymous (2007c). Maldives enters Second Life. *Agence France-Presse*, May 23, 2007. Retrieved July 30, 2007, from http://www.news.com.au/story/0,23599,21780232-7486,00.html.

Anonymous (2007d). Gartner warns businesses over virtual worlds. *ZDnet.com*, August 10, 2007. Retrieved August 30, 2007, from http://news.zdnet.co.uk/security/0,1000000189,39288496,00.htm.

Anthes, Gary (2007). Second Life: Is there any there there? *Computerworld*, November 14, 2007. Retrieved November 20, 2007, from http://www.computerworld.com/action/article.do?command=viewArticleBasic&taxonomyName=internet_business&articleId=9044800&taxonomyId=71&intsrc=kc_feat.

Argus, Evian (2007). Vietnam Veterans Memorial Wall in SL. *CNN: SL I-Reports*, November 12, 2007. Retrieved December 13, 2007, from http://secondlife.blogs.cnn.com/2007/11/12/vietnam-veterans-memorial-wall-in-sl/.

Associated Press (2007a). Virtual politician appears at Climate Summit: Computer technology turns Rep. into 3-D animation. *TheBostonChannel.com*, December 13, 2007. Retrieved December 21, 2007, from http://www.thebostonchannel.com/news/14833650/detail.html.

Associated Press (2007b). Japan to open G-rated virtual world. *CNN.com*, September 28, 2007. Retrieved October 1, 2007, from http://www.cnn.com/2007/TECH/09/28/virtual.tokyo.ap/index.html.

Au, Wagner James (2008a). All politics is virtual. *The Huffington Post*, March 12, 2008. Retrieved March 13, 2008, from http://www.huffingtonpost.com/wagner-james-au/all-politics-is-virtual_b_91139.html.

Au, Wagner James (2008b). China plays duplicitous game with online gamers. *GigaOM*, January 17, 2008. Retrieved April 2, 2008, from http://gigaom.com/2008/01/17/china-plays-duplicitous-game-with-online-gamers/.

Au, Wagner James (2007a). Debunking 5 business myths about Second Life. *GigaOM*, July 12, 2007. Retrieved August 30, 2007, from http://gigaom.com/2007/07/12/debunking-5-business-myths-about-second-life/.

Au, Wagner James (2007b). Half a million member metaverse: Second Life plateaus at 538K active users. *New World Notes*, December 18, 2007. Retrieved January 2, 2008, from http://nwn.blogs.com/nwn/2007/12/half-a-million.html.

Avatar (2008). In *Wikipedia, The Free Encyclopedia*. Retrieved May 1, 2008, from http://en.wikipedia.org/w/index.php?title=Avatar&oldid=208381085.

Bain, Ben (2007). Web 2.0: CDC invests in Second Life real estate. *Government Health IT*, August 10, 2007. Retrieved September 2, 2007, from http://www.govhealthit.com/article103477-8-10-2007.

Barlow, Nova (2007). The making of World Without Oil. *The Escapist*, September 18, 2007. Retrieved February 8, 2008, from http://www.escapistmagazine.com/articles/view/issues/issue_115/1959-The-Making-of-World-Without-Oil.

Barnes, Brooks (2007). Web playgrounds of the very young. *The New York Times*, December 31, 2007. Retrieved January 3, 2008, from http://www.nytimes.com/2007/12/31/business/31virtual.html?_r=2&oref=slogin&oref=slogin.

Beer, Stan (2007). Second Life a security risk for businesses: Gartner. *IT Wire*, August 7, 2007. Retrieved August 30, 2007, from http://www.itwire.com/content/view/13912/53/.

Beller, Matthew (2007). The Coming Second Life Business Cycle. *Ludwig von Mises Institute*, August 2, 2007. Retrieved August 11, 2007, from http://www.mises.org/story/2640.

Bennett, Jessica and Malcolm Beith (2007). Why millions are living virtual lives online: Second Life is emerging as a powerful new medium for social interactions of all sorts, from romance to making money. It may be the Internet's next big thing. *Newsweek*, July 30, 2007. Retrieved August 5, 2007, from http://www.msnbc.msn.com/id/19876812/site/newsweek/.

Bhartiya, Swapnil (2007). Thomas Frey: People are giving birth to empire of one. *EFY Times*, June 30, 2007. Retrieved August 29, 2007, from http://www.efytimes.com/efytimes/fullnews.asp?edid=20045&magid=27.

Blue, Laura (2007). World of Warcraft: A pandemic lab? *Time*, August 22, 2007. Retrieved September 17, 2007, from http://www.time.com/time/health/article/0,8599,1655109,00.html.

Boelhouwer, Steve (2007). Machinima gets a day job—The emerging use of game technology in feature films. *Cinema Without Borders*, February 10, 2007. Retrieved March 19, 2008, from http://www.cinemawithoutborders.com/print.php?a=1186.

Bollier, David (2007). *The rise of collective intelligence: Decentralized co-creation of value as a new paradigm of commerce and culture*. A report of the Sixteenth Annual Aspen Institute Roundtable on Information Technology. Washington, DC: The Aspen Institute. Retrieved February 2, 2008, from http://www.aspeninstitute.org/atf/cf/%7Bdeb6f227-659b-4ec8-8f84-8df23ca704f5%7D/C&S2007INFOTECHREPORT.PDF.

Booker, Caleb (2007a). The economics of fun. *Metaversed*, November 19, 2007. Retrieved November 21, 2007, from http://metaversed. com/21-nov-2007/economics-fun.

Booker, Caleb (2007b). Higher education takes on the virtual world. *Metaversed*, November 29, 2007. Retrieved November 30, 2007, from http:// metaversed.com/28-nov-2007/higher-education-takes-virtual-world.

Boran, Marie (2007). UCD opens Ireland's first library on Second Life. *Silicon Republic*, June 29, 2007. Retrieved August 26, 2007, from http:// www.siliconrepublic.com/news/news. nv?storyid=single8674.

Boyd, Andrew (2007). Second Life: Thinking about a virtual shopfront? *Blogdotgov*, June 18, 2007. Retrieved July 6, 2007, http://blogdotgov.com/2007/ 06/18/second-life-thinking-about-a-virtual-shopfront/.

Bradshaw, Della (2007). Insead heads for Second Life. *The Financial Times*, March 21, 2007. Retrieved September 1, 2007, from http:// www.ft.com/cms/s/a8bb490a-d7ca-11db-b218-000b5df10621.html.

Brewin, Bob (2007). Intelligence community developing virtual world analysis tools. *Government Executive*, November 7, 2007. Retrieved November 12, 2007, from http://www.govexec.com/story_page. cfm?articleid=38498&dcn=todaysnews.

Broache, Anne (2008). Ban 'Second Life' in schools and libraries, Republican congressman says. *CNet News*, May 7, 2008. Retrieved May 9, 2008, from http://www.news.com/8301-10784_3-9937956-7. html?tag=nefd.top.

Bush, Rita and Kenneth Kisiel (2007). *Information & behavior exploitation in virtual worlds: An overview*. A Report from the Office of the Director of National Intelligence and the Intelligence Advanced Research Projects Activity. Retrieved April 13, 2008, from http://blog.wired.com/27bstroke6/files/info_ exploitation_in_virtual_worldsiarpanov071.pdf.

Calongne, Cynthia and Jeff Hiles (2007). *White Paper—Blended realities: A virtual tour of education in Second Life*. Retrieved May 10, 2007, from http://edumuve.com/blended/ BlendedRealitiesCalongneHiles.pdf.

Carr, David F. (2007a). Second Life: Is business ready for virtual worlds? *Baseline*, March 1, 2007. Retrieved June 2, 2007, from http://www.baselinemag.com/ print_article2/0,1217,a=202017,00.asp.

Carr, David F. (2007b). Virtual growing pains. *Baseline*, March 1, 2007. Retrieved June 2, 2007, from http://www.baselinemag.com/c/a/Projects-Management/Virtual-Growing-Pains/.

Castelli, Elise (2008). It's all how you play the game. *Federal Times*, January 28, 2008. Retrieved January 30, 2008, from http://federaltimes.com/index. php?S=3333068.

Castronova, Edward (2005). Real products in imaginary worlds. *Harvard Business Review*, May 2005: 20–22.

The Center for Advanced Transportation Technology (CATT) (2008). Press Release: Preparing for real-life disasters in the virtual world: Clark School develops online training environment for emergency responders. A. James Clark School of Engineering, University of Maryland, College Park, October 16, 2007. Retrieved February 18, 2008, from http://www.catt. umd.edu/news/news_story.php?id=2596.

Chan, Wade-Hahn (2008a). Lawmakers hold first hearing in Second Life. *Federal Computer Week*, April 1, 2008. Retrieved April 3, 2008, from http://www.fcw.com/online/news/152099-1.html.

Chan, Wade-Hahn (2008b). Got game? NASA wants to know. *Federal Computer Week*, January 18, 2008. Retrieved February 10, 2008, from http://www.fcw. com/online/news/151377-1.html.

Chan, Wade-Hahn (2007). Learning could be fun and games at TSA. *Federal Computer Week*, July 31, 2007. Retrieved January 18, 2008, from http://www. fcw.com/online/news/103369-1.html.

Cid, Victor and Laura Bartlett (2007). Government information outreach in social media and virtual worlds. *USA Services Intergovernmental Newsletter*, Issue 20 (Fall 2007): 38–40.

Clark, Hannah (2007). Who's afraid of Second Life? *Forbes*, January 27, 2007. Retrieved July 1, 2007, from http://www.forbes.com/corporatecitizenship/2007/01/27/second-life-marketing-lead-citizen-cx_hc_davos07_0127disrupt.html.

Cole, Juan (2008). Osama bin Laden's "Second Life": In virtual worlds, does it take two terrorists to tango? And how much should we worry about those secret stockpiles of cartoon weapons? *Salon.com*, February 25, 2008. Retrieved February 26, 2008, from http://www.salon.com/opinion/feature/2008/02/25/avatars/print.html.

Cornwall, Daniel (2007). Nebraska Library Commission has clear purpose in Second Life. *Free Government Information*, June 24, 2007. Retrieved August 1, 2007, from http://freegovinfo.info/taxonomy/term/295.

Crovitz, L. Gordon (2008). From Wikinomics to Government 2.0. *The Wall Street Journal*, May 12, 2008: A13.

Cummins, H. J. (2007). Second Life: Reality growing in the virtual world for business and government. *Government Technology*, February 1, 2007. Retrieved December 19, 2007, from http://www.govtech.com/gt/print_article.php?id=103707.

Cutlack, Gary (2007). Pet Shop Boys Go Fest—in Second Life. *Tech Digest*, June 20, 2007. Retrieved August 26, 2007, from http://techdigest.tv/2007/06/pet_shop_boys_g.html.

Dell, Kristina (2008). How Second Life affects real life. *Time*, May 12, 2008. Retrieved May 14, 2008, from http://www.time.com/time/health/article/0,8599,1739601,00.html.

de Nood, David and Jelle Attema (2006). EPN Report: Second Life—The Second Life of virtual reality. December 1, 2006. Retrieved June 27, 2007, from http://www.epn.net/interrealiteit/EPN-REPORT-The_Second_Life_of_VR.pdf.

Derryberry, Anne (2008). *Serious games: online games for learning – An Adobe White Paper*. February 2008. Retrieved February 11, 2008, from http://www.adobe.com/resources/elearning/pdfs/serious_games_wp.pdf.

DFC Intelligence (2007). Press Release: Worldwide Market Forecasts for the Video Game and Interactive Entertainment Industry. September 18, 2007. Retrieved March 2, 2008, from http://www.dfcint.com/wp/?p=189.

Dickson, Simon (2007). E-government comes to Second Life. November 19, 2007. Retrieved November 21, 2007, from http://simondickson.wordpress.com/2007/11/19/e-government-comes-to-second-life/.

Dignan, Larry (2007). Will voice make Second Life more business friendly? *ZDNet.com*, April 24, 2007. Retrieved May 11, 2007, from http://blogs.zdnet.com/BTL/?p=4913.

Dignan, Larry (2006). Who will govern virtual worlds? *ZDNet.com*, December 1, 2006. Retrieved May 3, 2007, from http://blogs.zdnet.com/BTL/?p=4041.

Dorobek, Christopher J. (2007). Praising experimentation: Web 2.0 technologies may be difficult to assess in terms of ROI, but there is potential in those technologies. *Federal Computer Week*, August 20, 2007. Retrieved October 15, 2007, from http://www.fcw.com/print/13_29/news/103508-1.html.

Dunn, John E. (2008). Pranksters hack UK Government virtual world: From "safe life" to "no life at all." *Techworld*, April 1, 2008. Retrieved April 7, 2008, from http://www.techworld.com/security/news/index.cfm?newsID=11852&pagtype=samechan.

eMarketer (2008). A second look at virtual worlds. *eMarketer*, April 14, 2008. Retrieved April 17, 2008, from http://www.emarketer.com/Article.aspx?id=1006166&src=article1_newsltr.

Eustace, Chantal (2007). VPD: Virtual Police Department—Vancouver's police have turned to the make-believe world of online virtual reality in a groundbreaking bid to attract tech-savvy real-life recruits. *The Vancouver Sun*, May 29, 2007. Retrieved January 12, 2008, from http://www.canada.com/vancouversun/news/story.html?id=0c37d98d-c54f-44d3-9e72-0c19cf828565&k=56002.

Evans, Catherine (2007). Married in Second Life, Engaged in Real Life. *Wales on Sunday*, August 5, 2007. Retrieved September 18, 2007, from http://www.technewsworld.com/story/57456.html.

Felten, Ed (2005). Virtual world, meet terrestrial government. *Freedom-to-tinker.com*, October 11, 2005. Retrieved May 3, 2007, from http://www.freedom-to-tinker.com/?p=908.

Ferret, Wily (2007). Second Life shuts down casinos: Shocked, shocked to find gambling going on here. *The Inquirer*, July 26, 2007. http://theinquirer.net/default.aspx?article=41240.

Fogarty, David (2007). The virtue in being virtual in Bali. *Reuters*, December 11, 2007. Retrieved December 21, 2007, from http://blogs.reuters.com/environment/2007/12/11/the-virtue-in-being-virtual-in-bali/.

Fondazione Sistema Toscana (2007). Press release: Tuscany gets even bigger—on "Second Life"! Five additional "lands" added to the virtual territory. August 27, 2007. Retrieved January 3, 2008, from http://www.intoscana.it/intoscana/vivere_in_toscana.jsp?id_categoria=1281&id_sottocategoria=1283&id=116927&language=en.

Forterra Systems, Inc. (2008). Press Release: IBM, Forterra using unified communications in virtual worlds to solve "Tower of Babel" for intelligence agencies. March 20, 2008. Retrieved March 27, 2008, from http://www.forterrainc.com/news/press_032008.php.

Garreau, Joel (2007). Is there a future for old-fashioned museums? If the Spirit of St. Louis can come alive on your desktop, you might not want to trek to the Mall. *The Washington Post*, October 7, 2007. Retrieved October 15, 2007, from http://www.washingtonpost.com/wp-dyn/content/story/2007/10/05/ST2007100501535.html.

Gartner (2007). Gartner says 80 percent of active Internet users will have a "Second Life" in the virtual world by the end of 2011. April 24, 2007. Retrieved September 13, 2007, from http://www.gartner.com/it/page.jsp?id=503861.

Gaylord, Chris (2008). Can Web-based worlds teach us about the real one? Researchers are eager to study millions of online gamers that live in 'virtual' communities such as Second Life, hoping to gain insight into our 'real world' behaviors. *The Christian Science Monitor*, January 23, 2008. Retrieved January 26, 2008, from http://www.csmonitor.com/2008/0123/p13s01-stct.htm.

Gelernter, David (1992). *Mirror Worlds: Or the day software puts the universe in a shoebox... How it will happen and what it will mean*. New York: Oxford University Press, USA.

Gibson, William (2007). The novelty of being one step ahead. *New Media Age*, August 2, 2007, 8–10.

Gibson, William (1984). *Neuromancer*. New York: Ace Books.

Graft, Kris (2007). US Army founds gaming office. *Next Generation*, December 13, 2007. Retrieved December 31, 2007, from http://www.next-gen.biz/index.php?option=com_content&task=view&id=8337&Itemid=2.

Graves, Lucia (2008). A Second Life for higher ed: A virtual world offers new opportunities for teaching. *U.S. News & World Report*, January 10, 2008. Retrieved January 18, 2008, from http://www.usnews.com/articles/education/e-learning/2008/01/10/a-second-life-for-higher-ed_print.htm.

Greenberg, Andy (2008). Building the Feds' Virtual War Room. *Forbes.com*, March 20, 2008. Retrieved March 27, 2008, from http://www.forbes.com/technology/2008/03/20/cyberspies-virtual-feds-tech-security-cx_ag_0320virtual.html.

Greenberg, Andy (2007). Digital media: Second Life goes legit. *Forbes*, July 26, 2007. Retrieved September 6, 2007, from http://www.forbes.com/technology/2007/07/26/second-life-gambling-tech-security-cx_ag_0726secondlife.html.

Greenfield, Dave (2008). Doing business in the virtual world. *eWeek*, March 8, 2008. Retrieved March 13, 2008, from http://www.eweek.com/c/a/Infrastructure/Doing-Business-in-the-Virtual-World/.

Greto, Victor (2008). Here, you can be your own creator: In the virtual world of 'Second Life,' users can let imaginations run wild. *The News Journal (Delaware)*, February 17, 2008. Retrieved February 18, 2008, from http://www.delawareonline.com/apps/pbcs.dll/article?AID=/20080217/LIFE/802170335.

Gross, Grant (2007). Young government IT workers say tech is dated, says study. *InterGovWorld*, November 29, 2007. Retrieved December 10, 2007, from http://www.intergovworld.com/article/8820d1940a01040800129ddab1d29418/pg1.htm.

Grossman, Lev and Richard Lacyo (2005). The 100 best novels, 1923 to the present. *Time,* May 5, 2005. Retrieved September 26, 2007, from http://www.time.com/time/2005/100books/the_complete_list.html.

Guess, Andy (2008). Blogs and wikis and 3D, oh my! *Inside Higher Ed*, May 9, 2008. Retrieved May 10, 2008, from http://www.insidehighered.com/news/2008/05/09/blogs.

Haegele, Katie (2007). Online, Second Life avatars are prosing and poetizing. *The Philadelphia Inquirer*, July 1, 2007, 2007. Retrieved August 29, 2007, from http://www.philly.com/inquirer/currents/books/8268452.html.

Hansen, Steve (2008). Virtual Worlds: Synopsis of user interfaces and accessibility initiatives. Presentation to The Fourteenth Australasian World Wide Web Conference, April 2008, Ballina, New South Wales, Australia. Retrieved June 10, 2008, from http://ausweb.scu.edu.au/aw08/papers/refereed/hansen2/paper.html.

Havenstein, Heather (2007). Gartner urges caution on virtual-world business: Companies that want to protect their brands or reputations should be cautious about operating on such Web sites, research firm Gartner warns. *Computerworld*, August 9, 2007. Retrieved August 9, 2007, from http://www.pcworld.com/article/id,135773-pg,1/article.html.

Hayes, Frank (2007). Virtual trouble. *Computerworld*, August 13, 2007. 41(33): 52.

Hemp, Paul (2007). The demise of Second Life? *Harvard Business School Press Conversations*, July 26, 2007, 2007. Retrieved August 6, 2007, from http://conversationstarter.hbsp.com/2007/07/the_demise_of_second_life.html.

Herman, Dan (2008). Second Life and government. *Wikinomics*, January 11, 2008. Retrieved January 12, 2008, from http://www.wikinomics.com/blog/index.php/2008/01/11/second-life-and-government/.

Hespos, Tom (2007). Is Second Life right for your brand? *iMedia Connection*, March 1, 2007. Retrieved September 11, 2007, from http://www.imediaconnection.com/content/13872.asp.

Hill, Kimberly (2007). Exploring the underbelly of Second Life. *TechNewsWorld*, May 19, 2007. Retrieved August 3, 2007, from http://www.technewsworld.com/story/57456.html.

Hof, Robert D. (2006). My virtual life: A journey into a place in cyberspace where thousands of people have imaginary lives. *Business Week*, May 1, 2006. Retrieved February 13, 2007, from http://www.businessweek.com/magazine/content/06_18/b3982001.htm.

Hohmann, James (2008). House panel takes a whirl in virtual world: A subcommittee meeting on the Internet portal is simulcast on the popular fantasy site Second Life. *Los Angeles Times*, April 2, 2008. Retrieved April 4, 2008, from http://www.latimes.com/news/nationworld/nation/la-na-virtual-2apr02,1,4537293.story.

Holden, Kevin (2008). NASA dreams of an inter-planetary 'Second Life' for Mars crew. *Wired,* January 3, 2008. Retrieved January 6, 2008, from http://www.wired.com/science/discoveries/news/2008/01/nasa_virtual_worlds.

Holmes, Allan (2008a). New blog on virtual government. *Government Executive*, February 7, 2008. Retrieved February 8, 2008, from http://blogs.gov-exec.com/techinsider/archives/2008/02/new_blog_on_virtual_government.php.

Holmes, Allan (2008b). NASA's Second Life. *Government Executive*, January 23, 2008. Retrieved January 25, 2008, from http://blogs.govexec.com/techinsider/archives/2008/01/nasas_second_life.php.

Huffhines, Aldon (2008). Recruiters find success in Second Life. *Second Life News Network*, February 11, 2008. Retrieved April 30, 2008, from http://www.slnn.com/index.php?SCREEN=article&about=recruiting-in-second-life.

Hulme, George (2008). Bank failure spawns new regulations. *Information Week*, January 22, 2008. Retrieved January 25, 2008, from http://www.infor-mationweek.com/blog/main/archives/2008/01/bank_failure_sp.html;jsessionid=EDVJE25SYSTU4QSNDLPSKH0CJUNN2JVN?print=true.

Humphrys, John (2008). A world strip of humanity—inside the virtual reality websites where you can live out your wildest (and darkest) fantasies. *The Daily Mail,* January 5, 2008. Retrieved January 6, 2008, from http://www.dailymail.co.uk/pages/live/articles/news/news.html?in_article_id=506162&in_page_id=1770.

Hutchinson, Roger (2007). Reality bytes. Review of *Second Lives: A Journey through Virtual Worlds*. *The Scotsman*, June 30, 2007. Retrieved August 29, 2007, from http://living.scotsman.com/books.cfm?id=1021002007&format=print.

IBM Research (2007). *IBM Virtual World Guidelines*. Retrieved April 23, 2008, from http://domino.research.ibm.com/comm/research_projects.nsf/pages/virtualworlds.IBMVirtualWorldGuidelines.html.

Institute for Intelligence Studies at Mercyhurst College (2008). *The Virtual Jihad Project*. Retrieved May 8, 2008, from https://secondter.wikispaces.com/.

Jackson, Nancy Mann (2008). State of Blogging: Lawmakers are creating blogs to get their constitu-ents involved. *State Legislatures*, May 2008. Retrieved May 5, 2008, from http://www.ncsl.org/magazine/articles/2008/08slMay08_Blogging.htm.

Jana, Reena and Aili McConnon (2006). PLAYBOOK: Going virtual—How to get a Second Life. *Business Week*, October 30, 2006. Retrieved January 16, 2007, from http://www.businessweek.com/playbook/06/1030_1.htm.

Jenkins, Henry (2007). Henry Jenkins on Second Life's effect on first life politics. *Hyperorg*, March 12, 2007. Retrieved September 6, 2007, from http://www.hyperorg.com/blogger/mtarchive/henry_jenkins_on_second_lifes.html.

Joly, Karine (2007). A Second Life for higher educa-tion? Virtual worlds may wind up breathing new life into teaching, learning, and creative expression. *University Business*, June 2007. Retrieved July 6, 2007 from http://www.universitybusiness.com/ViewArticle.aspx?articleid=797.

Jukes, Ian and Anita Dosaj (2008). The differences between digital native learners and digital immigrant teachers. Apple.com, February 2008. Retrieved February 11, 2008, from http://www.apple.com/au/education/digitalkids/disconnect/landscape.html.

Kaplan, Peter (2008). Avatars at House hearing on virtual world. *Scientific American*, April 1, 2008. Retrieved April 7, 2008, from http://www.sciam.com/article.cfm?id=avatars-at-house-hearing&print=true.

Kauffman, Tim (2007). Feds turn to social network-ing Web sites. *Federal Times*, December 12, 2007. Retrieved December 16, 2007, from http://federal-times.com/index.php?S=3240006.

Kelly, Brian (2008). Is Second Life Accessible? *UK Web Focus*, January 14, 2008. Retrieved June 10, 2008, from http://ukwebfocus.wordpress. com/2008/01/14/is-second-life-accessible/.

Kelly, Henry (2007). *Building virtual worlds for education and training: A white paper from The Federation of American Scientists* (November 2007). Retrieved November 19, 2007, from http://vworld. fas.org/bin/view/Main/WhitePaper.

Kelly, Neon (2007). Virtual hospital opens doors: Second Life hospital to demonstrate future of health-care in London. *Computing*, September 6, 2007. Retrieved January 13, 2008, from http://www.com-puting.co.uk/computing/news/2198180/virtual-hospital-opens-doors-3448339.

Kimban, Dandellion (2007). Serbia has big plans for Second Life. *Second Life News Network*, November 19, 2007. Retrieved November 21, 2007, from http://www.slnn.com/article/serbia-island/.

Kirkpatrick, David (2008). Web 2.0 gets down to business: Business people find ways to save time and make money from social software pioneered by their kids. *Fortune*, March 25, 2008. Retrieved June 8, 2008, from http://money.cnn.com/2008/03/19/ technology/web2.0_goofing.fortune/.

Kirkpatrick, David (2007). It's not a game: The 3-D online experience Second Life is a hit with users. IBM's Sam Palmisano and other tech leaders think it could be a gold mine. *Fortune*, February 5, 2007, 155(2): 56–62.

Knight, Matthew (2007). Musicians aim to create virtual choir. *CNN.com*, August 3, 2007. Retrieved October 1, 2007, from http://www.cnn.com/2007/ TECH/08/03/fs.virtualchoir/index.html#cnnSTCText ?iref=werecommend.

Koman, Richard (2008). IBM project aims to put Second Life inside the firewall. *CIO Today*, April 3, 2008. Retrieved April 7, 2008, from http://www. cio-today.com/story.xhtml?story_id=010000Z2JMLQ.

Koudry, Alex and Terry Weaver (2008). Section 508: How it applies to Virtual Worlds. Presentation to the Federal Consortium for Virtual Worlds Conference, National Defense University, Washington, DC, April 2008. Retrieved June 11, 2008, from http://www. ndu.edu/irmc/fedconsortium_agenda.html.

Krangel, Eric (aka Eric Reuters) (2008a). SL posts strong economic growth on dwindling enrollments. *Reuters*, April 15, 2008. Retrieved April 25, 2008, from http://secondlife.reuters.com/stories/2008/ 04/15/sl-posts-strong-economic-growth-on-dwindling-enrollments/.

Krangel, Eric (aka Eric Reuters) (2008b). Linden Lab picks online marketing executive as CEO. *Reuters*, April 22, 2008. Retrieved April 25, 2008, from http://secondlife.reuters.com/stories/2008/04/22/ linden-lab-picks-online-marketing-executive-as-ceo/.

Krangel, Eric (aka Eric Reuters) (2007a). Increased supply spurs fear of Second Life land glut. *Informa-tion Week*, August 1, 2007. Retrieved September 15, 2007, from http://www.informationweek.com/ shared/printableArticle.jhtml?articleID=201201920.

Krangel, Eric (aka Eric Reuters) (2007b). European residents angry, but not leaving, over VAT. *Reuters*, October 2, 2007. Retrieved December 10, 2007, from http://secondlife.reuters.com/stories/2007/10/ 02/european-residents-angry-but-not-leaving-over-vat/.

Kurs, Simon (2007). Welcome to the unreal world: The hugely successful online game Second Life has developed an intriguing ability to blur the lines of reality as we know it. *The Sunday Times*, July 1, 2007. Retrieved August 29, 2007, from http:// technology.timesonline.co.uk/tol/news/tech_and_ web/personal_tech/article2004489.ece.

Kushner, David (2007). Inside Second Life: Is the hottest spot on the Net paradise on Earth or some-thing a little more sordid? *Rolling Stone*, April 26, 2007. Retrieved May 13, 2007, from http:// www.rollingstone.com/politics/story/14306294/ second_life_the_nets_virtual_paradise_heats_up.

Lamont, Ian (2007). Second Life: What's there is potential. *Computerworld*, November 14, 2007. Retrieved November 20, 2007, from http://www.computerworld.com/action/article.do?command=viewArticleBasic&articleId=9045079.

Last, Jonathan V. (2007a). Get a (Second) Life!: The avatars are coming. *The Weekly Standard*, October 1, 2007. Retrieved October 16, 2007, from http://weeklystandard.com/Content/Public/Articles/000/000/014/145mliuh.asp.

Last, Jonathan V. (2007b). Newt's Second Life: On the cyber-stump. *The Weekly Standard*, October 3, 2007. Retrieved October 16, 2007, from http://www.theweeklystandard.com/Content/Public/Articles/000/000/014/182satlx.asp.

Laurent, Anne (2008). Be the data. *Government Executive*, January 25, 2008. Retrieved January 28, 2008, from http://blogs.govexec.com/techinsider/archives/2008/01/be_the_data.php.

Lavallee, Andrew (2006). Now, virtual fashion: Second Life designers make real money creating clothes for simulation game's players. *The Wall Street Journal Online*, September 22, 2006. Retrieved May 20, 2007, from http://online.wsj.com/public/article/SB115888412923570768-zVZuILNMf6YlpTXqtuGcTAWcrWY_20070925.html?mod=blogs.

Lee, Rebecca (2007). Meet the Hottest Products of 2007: AOL Names the Most Buzzworthy Items of the Year. *ABC News*, December 19, 2007. Retrieved January 2, 2008, from http://www.abcnews.go.com/Business/Webcast/story?id=4026337&page=1.

Legrand, Roland (2008). Reading: US Air Force and the Millenial Generation. *Mixed Realities*, February 3, 2008. Retrieved February 10, 2008, from http://www.mixedrealities.com/?p=42.

Leonard, Devin (2008). Guess who's rewriting the rules of gaming?: Girls, office drones, and other non-teenage boys hooked on new, free-to-play online games, that's who. *Fortune*, April 18, 2008. Retrieved April 24, 2008, from http://money.cnn.com/2008/04/16/technology/leonard_games.fortune/index.htm?postversion=2008041805.

Linden Lab (2008a). *Second Life: Economic Statistics—April 2008*. Retrieved April 16, 2008, from http://secondlife.com/whatis/economy_stats.php.

Linden Lab (2008b). Second Life: Community Standards. Retrieved April 29, 2008, from http://secondlife.com/corporate/cs.php.

Llewelyn, Gwyneth (2007). Estonian Embassy opens in Second Life. *Gwynethllewelyn.net*, December 28, 2007. Retrieved January 17, 2008, from http://gwynethllewelyn.net/2007/12/28/estonian-embassy-opens-in-second-life/.

Lofgren, Eric T. and Nina H. Fefferman (2007). The untapped potential of virtual game worlds to shed light on real world epidemics. *The Lancet Infectious Diseases*, 7(9) September 2007: 625–629.

Lohr, Steve (2007). Free the avatars. *The New York Times*, October 10, 2007. Retrieved October 15, 2007, from http://bits.blogs.nytimes.com/2007/10/10/free-the-avatars/#more-519.

Lomas, Natasha (2007). Virtual worlds? Get a life, say silicon.com readers—thanks but no thanks. *Silicon.com*, June 2007. Retrieved July 24, 2007, from http://www.silicon.com/research/specialreports/virtualworlds/0,3800013956,39167565,00.htm.

Lorek, Laura (2007). Kids flock to sites especially designed for them. *San Antonio Express-News*, July 2, 2007. Retrieved August 19, 2007, from http://www.mysanantonio.com/business/stories/MYSA070107.1R.VW4Kidsmain.2a76afe.html.

Lynch, C. G. (2008). Companies explore virtual worlds as collaboration tools. *CIO*, February 6, 2008. Retrieved February 18, 2008, from http://www.cio.com/article/print/180301.

Lynch, C. G. (2007). Five things Wikipedia's founder has learned about online collaboration. *CIO*, June 28, 2007. Retrieved August 2, 2007, from http://www.cio.com/article/print/121711.

Mabeus, Courtney (2008). Spice up your next meeting: Wear wings. *Federal Times*, February 25, 2008. Retrieved February 29, 2008, from http://federaltimes.com/index.php?S=3387396.

McCaney, Kevin (2007). Technicalities. *Government Computer News*, December 10, 2007. Retrieved January 2, 2008, from http://www.gcn.com/print/26_30/45527-1.html.

McCarthy, Caroline (2007). Dwight Schrute gets a 'Second Life,' still needs a first one. *CnetNews.com*, October 26, 2007. Retrieved March 29, 2008, from http://www.news.com/8301-13577_3-9805349-36.html.

McConnon, Aili (2007). Just Ahead: The Web As A Virtual World. Imagine being able to have a digital replica of yourself stroll from one site to another. *Business Week*, August 13, 2007. Retrieved September 29, 2007, from http://www.business-week.com/magazine/content/07_33/b4046064.htm?chan=technology_technology+index+page_top+stories.

McConnon, Aili and Reena Jana (2007). Beyond Second Life: Companies thinking twice about the popular virtual world are finding more security and flexibility in alternatives. *Business Week*, June 11, 2007. Retrieved June 23, 2007, from http://www.businessweek.com/magazine/content/07_24/b4038417.htm.

McGonigal, Jane (2008). Breakthough ideas for 2008: Making alternate reality the new business reality. *Harvard Business Review*, February 2008. Retrieved January 30, 2008, from http://harvardbusinessonline.hbsp.harvard.edu/hbsp/hbr/articles/article.jsp?articleID=R0802A&ml_action=get-article&print=true&ml_issueid=BR0802.

McGookin, Steve (2007). Metaverse: "... And you press this button to fly." *Forbes*, July 3, 2007. Retrieved July 6, 2007, from http://www.forbes.com/leadership/2007/07/03/secondlife-business-meeting-lead-innovation-cx_sm_0703secondlife.html.

McMillan, Robert (2008). Does Al-Qaeda need a Second Life? *Network World*, January 7, 2008. Retrieved January 10, 2008, from http://www.networkworld.com/news/2008/010708-does-al-qaeda-need-a-second.html.

Mediamark Research & Intelligence (2007). Press release: Gaming nearly ubiquitous among kids online, one-third have email address. December 21, 2007. Retrieved January 2, 2008, from http://www.marketingcharts.com/direct/gaming-nearly-ubiquitous-among-kids-online-one-third-have-email-address-2839/.

Mello, John P., Jr. (2007). Strange rumblings in Second Life's economy. August 10, 2007. Retrieved September 7, 2007, from http://www.ecommercetimes.com/rsstory/58748.html.

Metz, Cade (2007). The Emperor's new Web. Some of the biggest names in high tech are convinced that Second Life and other virtual worlds are the future of the Net. *PC Magazine*, April 24, 2007, 26(9): 70–77.

Miga, Andrew (2007). Virtual Congressman speaks at summit. *Yahoo News*, December 12, 2007. Retrieved December 21, 2007, from http://news.yahoo.com/s/ap/20071212/ap_on_hi_te/techbit_markey_avatar.

Milbank, Dana (2008). Goofy characters and weird people—sounds like a hearing. *The Washington Post*, April 2, 2008. Retrieved April 3, 2008, from http://www.washingtonpost.com/wp-dyn/content/article/2008/04/01/AR2008040102372.html?sid=ST2008040103032.

Miller, Jason (2008). GSA to grade agencies on 508 compliance. *Federal Computer Week*, January 29, 2008. Retrieved June 12, 2008, from http://www.fcw.com/online/news/151454-1.html.

Miller, Jason Lee (2007). The web's most, biggest, best, and worst of 2007. *WebProNews*, December 28, 2007. Retrieved January 10, 2008, from http://www.webpronews.com/topnews/2007/12/28/the-webs-most-biggest-best-and-worst-of-2007.

Mims, Christopher (2007). Second Life chairman's stump speech takes us down the rabbit hole. *Scientific American Observations*, June 29, 2007. Retrieved July 15, 2007, from http://blog.sciam.com/index.php?title=second_life_chairman_s_stump_speech_take&more=1&c=1&tb=1&pb=1.

Mone, Gregory (2008). Are lobbyist lunches OK in Second Life? Congress holds a hearing on the potential—for good and ill—of virtual worlds. *Popular Science*, April 2, 2008. Retrieved April 3, 2008, from http://www.popsci.com/scitech/article/2008-04/are-lobbyist-lunches-ok-second-life.

Moran, Caitlin (2008). Some of my best friends are cyberpenguins. *The Times*, January 21, 2008. Retrieved January 23, 2008, from http://www.timesonline.co.uk/tol/comment/columnists/caitlin_moran/article3215915.ece.

Musgrove, Mike (2008). At hearing, real and virtual worlds collide—Forget C-SPAN: Congress goes interactive. *The Washington Post*, April 2, 2008. Retrieved April 3, 2008, from http://www.washingtonpost.com/wp-dyn/content/article/2008/04/01/AR2008040102426.html?sub=new.

Muthalaly, Shonali (2007). Get a life: In Second Life, the thriving online virtual world, you can be what you've always wanted to be and do things you've only dreamed of doing. Just make sure you have the cash. *The Hindu*, July 1, 2007. Retrieved August 2, 2007, from http://www.thehindu.com/thehindu/mag/2007/07/01/stories/2007070150220700.htm.

Naone, Erica (2007). Money trouble in Second Life: A series of upsets could spell trouble for Second Life's virtual economy. *Technology Review*, August 8, 2007. Retrieved December 15, 2007, from http://www.technologyreview.com/printer_friendly_article.aspx?id=19193.

NASA (National Aeronautics and Space Administration) (2008). NASA MMO Game: Frequently Asked Questions (FAQs). Retrieved April 3, 2008, from http://ipp.gsfc.nasa.gov/mmo/FAQs.html.

NASA CoLab (2007). CoLab virtual overview. November 29, 2007. Retrieved December 18, 2007, from http://colab.arc.nasa.gov/virtual.

Newitz, Annalee (2006). Your Second Life is ready. *Popular Science*, September 2006. Retrieved February 4, 2007, from http://www.popsci.com/popsci/technology/7ba1af8f3812d010vgnvcm100000 4eecbccdrcrd.html.

Nino, Tateru (2007). Second Life is the future of the 3D Web. *Second Life Insider*, July 14, 2007. Retrieved September 11, 2007, from http://www.secondlifeinsider.com/2007/07/14/second-life-is-the-future-of-the-3d-web/.

Noyes, Andrew (2007). Management matters: Shadow IT. *Government Executive*, October 10, 2007. Retrieved October 15, 2007, from http://govexec.com/dailyfed/1007/101007mm.htm.

Nylen, Leah (2008). Is it live—or is it Second Life? Only the Avatars know for sure. *Congressional Quarterly*, April 1, 2008. Retrieved April 4, 2008, from http://www.cqpolitics.com/wmspage.cfm?docID=news-000002694429.

O'Brien, Natalie (2007). Virtual terrorists: Hunted in reality, jihadists are turning to artificial online worlds such as Second Life to train and recruit members. *The Australian*, July 31, 2007. Retrieved August 8, 2007, from http://www.theaustralian.news.com.au/story/0,25197,22161037-28737,00.html.

Office of the Director of National Intelligence (2008). *Data Mining Report* (Issued February 15, 2008). Retrieved February 26, 2008, from http://www.fas.org/irp/dni/datamining.pdf.

O'Harrow, Robert, Jr. (2008). Spies' battleground turns virtual: Intelligence officials see 3-D online worlds as havens for criminals. *The Washington Post*, February 6, 2008. Retrieved February 8, 2008, from http://www.washingtonpost.com/wp-dyn/content/article/2008/02/05/AR2008020503144_pf.html.

O'Mahony, Paul (2007). Sweden trumped by Maldives in Second Life. *The Local*, May 22, 2007. Retrieved March 4, 2008, from http://www.thelocal.se/7379/20070522/.

Parris, Colin J. (2007). Building an immersive Web. *Technology Review*, July 2007, 110(4): 26.

Pasick, Adam (aka Adam Reuters) (2008). IBM to host private Second Life regions. *The Washington Post*, April 2, 2008. Retrieved April 3, 2008, from http://www.washingtonpost.com/wp-dyn/content/article/2008/04/02/AR2008040203365_pf.html.

Peck, Michael (2007). U.S. Army embraces games—sort of. *Training & Simulation Journal*, December 24, 2007. Retrieved December 31, 2007, from http://www.tsjonline.com/story.php?F=3115940.

Pellerin, Cheryl (2007). U.S. government presence grows in Second Life online world. *USINFO*, May 8, 2007. Retrieved August 3, 2007, from http://usinfo.state.gov/xarchives/display.html?p=washfile-english&y=2007&m=May&x=20070508163536lcnirellep0.2645075.

Perla, Peter (1990). *The Art of Wargaming*. Annapolis, MD: Naval Institute Press.

Peters, Tom, and Lori Bell (2007). Otherworldly accessibility. *Computers in Libraries*, October 2007, 27(9): 38–40.

Pinckard, Jane (2006). Is World of Warcraft the new golf? Tech entrepreneurs meet, quest, talk shop. *1up*, February 8, 2006. Retrieved September 15, 2007, from http://www.1up.com/do/newsStory?cId=3147826.

Prensky, Marc (2005/2006). Learning in the digital age. *Educational Leadership*, 63(4) (December 2005/January 2006): 8–13.

Prensky, Marc (2001). Digital natives, digital immigrants. *On the Horizon, 9*(5): 1–2.

Ranger, Steve (2007a). Wary of wikis? Cynical about Second Life? Relax—and use consumer tech to your business' benefit. *Silicon.com*, June 14, 2007. Retrieved July 24, 2007, from http://www.silicon.com/research/specialreports/virtualworlds/0,3800013956,39167499,00.htm.

Ranger, Steve (2007b). I, Avatar—I need an etiquette guide that covers flying in the office. *Silicon.com*, June 2007. Retrieved July 24, 2007, from http://www.silicon.com/research/specialreports/virtualworlds/0,3800013956,39167562,00.htm.

Rappeport, Alan (2007). Second Life's John Zdanowski: The CFO of Second Life explains what the online virtual world is all about, and how his real-world company measures and rewards employee performance with the Love Machine. *CFO Magazine*, October 1, 2007. Retrieved October 16, 2007, from http://www.cfo.com/printable/article.cfm/9858165/c_9891771?f=options

Raths, David (2008). Virtual worlds help public safety officials practice for real-life threats. *Government Technology*, March 27, 2008. Retrieved March 29, 2008, from http://www.govtech.com/gt/261426?topic=117693.

Rawlinson, Linnie (2007). Virtual worlds: The next Facebook? *CNN.com*, August 8, 2007. Retrieved October 1, 2007, from http://edition.cnn.com/2007/TECH/08/07/virtual.living/index.html.

Reeves, Byron, Thomas W. Malone, and Tony O'Driscoll (2008). Leadership's online labs. *Harvard Business Review*, 86(5), 58–66.

Riley, Duncan (2007a). Second Life: Europeans outnumber Americans 3 to 1. *Tech Crunch*, May 5, 2007. Retrieved June 16, 2007, from http://www.techcrunch.com/2007/05/05/second-life-europeans-outnumber-americans-3-to-1/.

Riley, Duncan (2007b). You're not in the USSR any more: Estonia opens an embassy in Second Life. *Tech Crunch*, December 5, 2007. Retrieved December 15, 2007, from http://www.techcrunch.com/2007/12/05/youre-not-in-the-ussr-any-more-estonia-opens-an-embassy-in-second-life/.

Rose, Frank (2007). How Madison Avenue is wasting millions on a deserted Second Life. *InformationWeek*, July 24, 2007. Retrieved August 20, 2007, from http://www.informationweek.com/shared/printableArticle.jhtml?articleID=201201920.

Roush, Wade (2007). Second Earth: The World Wide Web will soon be absorbed into the World Wide Sim: an environment combining elements of Second Life and Google Earth. *Technology Review*, July/August 2007. Retrieved March 30, 2008, from https://www.technologyreview.com/Infotech/18911/.

Roy, Jeffrey (2007). Why Parliament needs a Second Life. *CIO Government Review*, December 3, 2007. Retrieved December 10, 2007, from http://www. intergovworld.com/article/920d43b50a01040800 129dda0021d0db/pg1.htm.

Ryan, Emmet (2007). *Law & Order* takes on Second Life: The blurred lines between virtual worlds and the real world have been examined in a recent episode of US drama Law & Order: Special Victims Unit. *The Register*, October 8, 2007. Retrieved October 17, 2007, from http://www.theregister.co.uk /2007/10/08/second_life_tv_drama/.

Sarvary, Miklos (2008). Breakthough ideas for 2008: The metaverse—TV of the future? *Harvard Business Review*, February 2008. Retrieved January 30, 2008, from http://harvardbusinessonline.hbsp.harvard.edu/ hbsp/hbr/articles/article.jsp?articleID=R0802A&ml_ action=get-article&print=true&ml_issueid=BR0802.

Scola, Nancy (2007). Avatar politics: The applications of Second Life. Institute for Politics, Democracy & the Internet, Graduate School of Political Management of The George Washington University. January 10, 2007. Retrieved March 28, 2007, from http://www.ipdi.org/UploadedFiles/ Avatar%20Politics.pdf.

Sellers, Mike (2007). A virtual world winter? *Terra Nova*, December 20, 2007. Retrieved January 7, 2008, from http://terranova.blogs.com/terra_ nova/2007/12/a-virtual-world.html.

Shachtman, Noah (2007). Army sets up new office of videogames. *Wired*, December 12, 2007. Retrieved December 18, 2007, from http://blog. wired.com/defense/2007/12/armys-new-offic.html.

Sharp, Darren and Mandy Salomon (2008). *White paper: User-led innovation: A new framework for co-creating business and social value*. Swinburne University of Technology, January 2008. Retrieved February 2, 2008, from http://smartinternet.com.au/ ArticleDocuments/121/User_Led_Innovation_A_ New_Framework_for_Co-creating_Business_and_ Social_Value.pdf.aspx.

Shepherd, Sherrie (2008). Job fair targets IT professionals for the State of Missouri. Retrieved May 2, 2008, from http://it-careers.mo.gov/Docs/ JobFairStateofMissouri.pdf.

Shields, Mike (2007). CNN to launch bureau in Second Life virtual world. *Media Week*, October 29, 2007. Retrieved November 13, 2007, from http:// www.mediaweek.com/mw/search/article_display. jsp?vnu_content_id=1003664297.

Shirky, Clay (2006). A story too good to check. *ValleyWag*, December 12, 2006. Retrieved May 29, 2007, from http://valleywag.com/tech/second-life/ a-story-too-good-to-check-221252.php.

Sidel, Robin (2008). Cheer up, Ben: Your economy isn't as bad as this one. In the make-believe world of "Second Life," banks are really collapsing. *The Wall Street Journal*, January 23, 2008. Retrieved January 24, 2008, from http://online.wsj.com/public/ article_print/SB120104351064608025.html.

Singel, Ryan (2008). U.S. spies want to find terrorists in World of Warcraft. *Wired*, February 22, 2008. Retrieved February 26, 2008, from http://blog.wired. com/27bstroke6/2008/02/nations-spies-w.html.

Smart, John M., Jamais Cascio, and Jerry Paffendorf (2007). *Metaverse Roadmap Overview: Pathways to the 3D Web*. Retrieved February 14, 2008, from http://www.metaverseroadmap.org/overview/.

Smith, Mike (2008). World of Warcraft crosses 10 million milestone. *Yahoo Games*, January 24, 2008. Retrieved March 19, 2008, from http://videogames. yahoo.com/printview_feature?eid=1182041.

Smith, Roger (2008). *The long history of gaming for military training*. U.S. Army Simulation, Training and Instrumentation Program Executive Office, March 2008. Retrieved April 18, 2008, from http://www. peostri.army.mil/CTO/FILES/RSmith_Military_Game_ Training.pdf.

Sowers, Bill (2006). I have a feeling we're not in Kansas any more! *State Library of Kansas Newsletter*, January 2007. Retrieved November 13, 2007, from http://skyways.lib.ks.us/news/publish/ printer_00329.shtml.

Steel, Emily (2007). Marketers explore new virtual worlds: Some create own as Second Life site loses some luster. *The Wall Street Journal*, October 23, 2007. Retrieved October 30, 2007, from http://online.wsj.com/public/article/SB11930941225 5567685.html?mod=dist_smartbrief.

Steel, Emily (2006). Avatars at the office: More firms create virtual world "Second Life." *The Wall Street Journal Online*, November 11, 2006. Retrieved May 20, 2007, from http://www.careerjournalasia.com/hrcenter/articles/20061116-steel.html.

Stein, Rob (2007). Real hope in a virtual world: Online identities leave limitations behind. *The Washington Post*, October 6, 2007. Retrieved October 15, 2007, from http://www.washingtonpost.com/wp-dyn/content/article/2007/10/05/AR2007100502391_pf.html.

Steinkuehler, Constance and Dmitri Williams (2006). Where everybody knows your (screen) name: Online games as "third places." *Journal of Computer-Mediated Communication,* 11(4), article 1. Retrieved January 6, 2008, from http://jcmc.indiana.edu/vol11/issue4/steinkuehler.html.

Stephenson, Neal (1992). *Snow Crash*. New York: Bantam Books.

Stout, Kristie Lu (2007). A virtual me? I'll second that. *CNN.com*, January 18, 2007. Retrieved October 1, 2007, from http://www.cnn.com/2007/TECH/01/18/global.office.secondlife/index.html?iref=werecommend.

Strickland, Jonathan (2007). How machinima works. *How Stuff Works*, May 24, 2007. Retrieved August 30, 2008, from http://entertainment.howstuffworks.com/machinima.htm.

Stuhldreher, Katie (2007). Colleges bring learning to a Virtual World. *The Philadelphia Inquirer*, July 30, 2007. Retrieved August 30, 2007, from http://www.technewsworld.com/story/58558.html#.

Svetvilas, Chuleenan (2008). Real law in the virtual world: The future of the Internet may be in 3-D. *California Lawyer Magazine*, January 2008. Retrieved January 28, 2008, from http://californialawyer magazine.com/story.cfm?eid=890855&evid=1.

Talamasca, Akela (2007). The Maldives Virtual Embassy. Second Life Insider, May 23, 2007. Retrieved July 30, 2007, from http://www.secondlifeinsider.com/2007/05/23/the-maldives-virtual-embassy/.

Terdiman, Daniel (2007a). Tech titans seek virtual-world interoperability. *News.com*, October 15, 2007. Retrieved November 5, 2007, from http://www.news.com/2102-1043_3-6213148.html?tag=st.util.print.

Terdiman, Daniel (2007b). A winning business plan for "Second Life." *News.com*, February 20, 2007. Retrieved May 30, 2007, from http://news.com.com/A+winning+business+plan+for+Second+Life/2100-1025_3-6160433.html.

Terdiman, Daniel (2007c). Yankee Group: 'Second Life' doesn't live up to hype. *News.com*, October 1, 2007. Retrieved October 30, 2007, from http://www.news.com/8301-10784_3-9788702-7.html.

Thatcher, Jaciilyn (2008). SL I-Report: Want a new job? *CNN.com*, April 24, 2008. Retrieved April 29, 2008, from http://secondlife.blogs.cnn.com/2008/04/24/want-a-new-job/.

Tolva, John (2005). Recontextualizing the Collection: Virtual Reconstruction, Replacement, and Repatriation, in J. Trant and D. Bearman (eds). *Museums and the Web 2005: Proceedings, Toronto: Archives & Museum Informatics*, published March 31, 2005 at http://www.archimuse.com/mw2005/papers/tolva/tolva.html.

Trevena, Stan (2007). Federal Consortium for Virtual Worlds. *PacificRim Exchange*, November 16, 2007. Retrieved November 19, 2007, from http://pacificrimx.wordpress.com/2007/11/16/federal-consortium-for-virtual-worlds/.

Twohey, Megan (2008). Second Life could sexually exploit children via Internet, Rep. Mark Kirk says: Congressman calls for consumer-alert warning for online social network. *Chicago Tribune*, May 6, 2008. Retrieved May 9, 2008, from http://www.chicagotribune.com/features/chi-online-predator-alert-06-may06,0,894825.story.

United States Air Force, Air Education and Training Command (2008). *AETC White Paper—On learning: The future of Air Force education and training*. January 30, 2008. Retrieved February 5, 2008, from http://www.aetc.af.mil/shared/media/document/AFD-080130-066.pdf.

Urban, Richard, Paul Marty, and Michael Twidale (2007). A Second Life for your museum: 3D multi-user virtual environments and museums. In J. Trant and D. Bearman (eds). *Museums and the Web 2007: Proceedings*. Toronto: Archives & Museum Informatics, published March 31, 2007 at http://www.archimuse.com/mw2007/papers/urban/urban.html.

Varkey, Mithun (2008). Gamers freak out on cyber-space for adventure. *The Economic Times*, February 1, 2008. Retrieved February 6, 2008, from http://economictimes.indiatimes.com/articleshow/msid-2747511,prtpage-1.cms.

Verna, Paul (2008). Video gaming audience is fragmented. *eMarketer*, April 4, 2008. Retrieved April 7, 2008, from http://www.emarketer.com/Articles/Print.aspx?id=1006147&src=print_article_blue_bottom_article&xsrc=print2_articlex.

Vesta, Lebachai (2007). Grand opening of Cleveland Public Library. *CNN: SL I-Reports*, November 12, 2007. Retrieved December 13, 2007, from http://secondlife.blogs.cnn.com/2007/11/12/grand-opening-of-cleveland-public-library/.

Villiger, Niccolò (2007). Experience an Italian language lesson in Second Life. *PRWeb*, October 24, 2007. Retrieved April 22, 2008, from http://www.prweb.com/releases/2007/10/prweb563705.htm.

Virtual Worlds News (2008). Air Force unveils potential plans for MyBase Virtual World. *Virtual Worlds News*, February 1, 2008. Retrieved February 10, 2008, from http://www.virtualworldsnews.com/2008/02/air-force-unvei.html.

Wade, Alex (2007). Blurred boundaries. In Second Life, players can shop, gamble, buy land or even have sex. But this freedom to do virtually anything raises some increasingly difficult legal questions. *The Guardian Unlimited*, December 10, 2007. Retrieved December 30, 2007, from http://media.guardian.co.uk/digitallaw/story/0,,2225125,00.html.

Wagner, Mitch (2008). Turning work into play is no game. *Information Week*, February 22, 2008. Retrieved February 26, 2008, from http://www.informationweek.com/blog/main/archives/2008/02/turning_work_in.html.

Weber, Aimee (2006). NOAA comes to Second Life. *Second Life Insider*, August 18, 2006. Retrieved June 15, 2007, from http://www.secondlifeinsider.com/2006/08/18/noaa-comes-to-second-life/.

Weinberg, Jonathan (2007). Chinese get their own Second Life. *Tech Digest*, June 29, 2007. Retrieved August 26, 2007, from http://techdigest.tv/2007/06/chinese_get_the.html.

Weinberger, Sharon (2008). Introducing Iarpa: It's Like Darpa, But for Spies. *Wired*, March 24, 2008. Retrieved April 10, 2008, from http://www.wired.com/print/politics/security/magazine/16-04/st_alphageek.

Welles, Destiny (2007a). Theatre and democracy in Second Life. *The Register*, June 30, 2007. Retrieved August 29, 2007, from http://www.theregister.co.uk/2007/06/30/miles_from_broadway/.

Welles, Destiny (2007b). My big, fat, lily-white Second Life. *The Register*, January 30, 2007. Retrieved May 19, 2007, from http://www.theregister.co.uk/2007/01/30/lily_white_and_not_loving_it/.

Williams, Lisa (2008). Second Life has potential for public sector, says analyst. *InterGovWorld*, January 25, 2008. Retrieved January 26, 2008, from http://www.intergovworld.com/article/b17df76c0a-01040801160fa65d94c3aa/pg1.htm.

Williamson, Debra Aho (2007). Kids, teens and virtual worlds: It's a virtual, virtual world after all. *eMarketer*, September 25, 2007. Retrieved September 26, 2007, from http://www.emarketer.com/Article.aspx?id=1005410&src=article1_newsltr.

Wilson, Nick (2007). Simplicity and the virtual tipping point. *Metaversed*, November 6, 2007. Retrieved January 19, 2008, from http://metaversed.com/tags/news/virtual-worlds.

Withers, Matt (2007). A life less ordinary. *Wales on Sunday*, July 31, 2007. Retrieved September 17, 2007, from http://www.linuxinsider.com/story/58591.html.

Wong, David (2007). A World of Warcraft world: 10 ways online gaming will change the future. *Cracked*, November 15, 2007. Retrieved February 2, 2008, from http://www.cracked.com/article_15657_world-warcraft-world-10-ways-online-gaming-will-change-future.html.

Worthen, Ben (2007). Second Life: Just as bad as real life—Businesses have looked at virtual worlds like Second Life as a place to test new products or explore new business models. But a series of events over the last few weeks shows that Second Life may not be ready for primetime. *The Wall Street Journal*, August 9, 2007. Retrieved September 15, 2007, from http://blogs.wsj.com/biztech/2007/08/09/second-life-just-as-bad-as-real-life/.

Wyld, David C. (2007). *The Blogging Revolution: Government in the Age of Web 2.0*. IBM Center for The Business of Government, Washington, DC, June 2007. Retrieved July 2, 2007, from http://www.businessofgovernment.org/pdfs/WyldReportBlog.pdf.

Yankee Group (2007). News release: Yankee Group says hype of Second Life far outweighs its ability to impact mainstream interactivity. Future growth and consumer relevance will be limited by the tethered experience of virtual worlds. October 1, 2007. Retrieved November 10, 2007, from http://www.yankeegroup.com/press_release_tile32.jsp.

Young, G. Oliver (2007). IT will measure Web 2.0 tools like any other app: Tech marketers must prep for tough questions about ROI and business value. *Forrester Research*, July 25, 2007. Retrieved October 20, 2007, from http://www.forrester.com/Research/Document/Excerpt/0,7211,42814,00.html.

Yuen-C, Tham and Chua Hian Hou (2007). Govt agency buys island—in cyberspace. *Singapore Straits Times,* August 21, 2007. Retrieved September 10, 2007, from http://www.straitstimes.com/Free/Story/STIStory_150344.html.

Zimmer, Linda (2007a). Galveston, (oh Galveston) CVB comes to Second Life. *Business Communicators of Second Life*, January 15, 2007. Retrieved November 29, 2007, from http://freshtakes.typepad.com/sl_communicators/2007/01/galveston_oh_ga.html.

Zimmer, Linda (2007b). Tuscany Comes to Second Life on March 30. *Business Communicators of Second Life*, March 13, 2007. Retrieved November 29, 2007, from http://freshtakes.typepad.com/sl_communicators/2007/03/tuscany_comes_t.html.

Zimmer, Linda (2007c). How viable is virtual commerce? *Information Week*, January 1, 2007. Retrieved October 31, 2007, from http://www.informationweek.com/shared/printableArticle.jhtml?articleID=196700916.

Zyskowski, John (2008). Government enters the blogosphere. *Federal Computer Week*, May 12, 2008. Retrieved May 17, 2008, from http://www.fcw.com/print/22_13/features/152474-1.html.

A B O U T   T H E   A U T H O R

David C. Wyld currently serves as the Robert Maurin Professor of Management at Southeastern Louisiana University in Hammond, Louisiana, where he teaches courses in business strategy and e-commerce. He is the Director of the College of Business' Strategic e-Commerce/e-Government Initiative, the Founding Editor of the *Journal of Strategic e-Commerce*, and a frequent contributor to both academic journals and trade publications. In the past decade, he has established himself as one of the leading academic experts on emerging applications of technology in both the public and private sectors, including RFID, Web 2.0, blogging, reverse auctions, online surplus auctions, e-procurement, and, now, virtual worlds.

He has been an active consultant, a qualified expert witness, a prolific writer, and an invited speaker on the management of technology to both trade and academic audiences, as well as an invited panelist on technology issues on the Discovery Channel and other media outlets. His October 2005 report on RFID, entitled *RFID: The Right Frequency for Government*, is the most downloaded report ever for the IBM Center for The Business of Government. His 2007 report for the IBM Center, *The Blogging Revolution: Government in the Age of Web 2.0*, has been highly regarded both in the government and in the press around the world. This report is still pointed to by the USA.gov team as a how-to guide for bloggers in the public sector. For his work in the public sector arena, he was named a Rising Star in Government Information Technology by *Federal Computer Week* in 2006.

Dr. Wyld has written more than 130 refereed journal articles on a wide variety of subjects dealing with contemporary management issues. These have appeared in many leading business, technology, public policy, health care, and education journals. He has also been a frequent contributor to widely read publications in the popular and trade press, including *Computerworld* and *The Washington Times*. In recognition of his research accomplishments, Dr. Wyld has been awarded the campus-wide President's Award for Excellence in Research, while also having been recognized as the outstanding teacher in the College of Business.

In addition to his traditional teaching duties and research efforts, Dr. Wyld has served as a consultant to major corporations on a wide range of topics and an expert witness on e-commerce-related matters. He has participated extensively in delivering college classes to non-traditional students in divergent settings, teaching in Executive MBA programs, and working with emerging online teaching technologies. He was president of the Faculty Senate of Southeastern Louisiana University from 2003 to 2005.

Dr. Wyld earned his doctorate in management from the University of Memphis in 1993.

K E Y   C O N T A C T   I N F O R M A T I O N

To contact the author:

David C. Wyld
Southeastern Louisiana University
Robert Maurin Professor of Management and
Director of the Strategic e-Commerce/
e-Government Initiative
Department of Management
SLU - Box 10350
500 Western Avenue
Hammond, LA 70402-0350
(985) 542-6831 or (985) 549-2051
cell: (985) 789-2127
fax: (985) 549-2019

e-mail: dwyld@selu.edu

Second Life avatar: Roomie Jefferson

REPORTS from
The IBM Center for The Business of Government

**For a full listing of IBM Center publications,
visit the Center's website at *www.businessofgovernment.org*.**

Recent reports available on the website include:

Collaboration: Networks and Partnerships

Integrating Service Delivery Across Levels of Government: Case Studies of Canada and Other Countries by Jeffrey Roy and John Langford

A Manager's Guide to Resolving Conflicts in Collaborative Networks by Rosemary O'Leary and Lisa Blomgren Bingham

Contracting

Success Factors for Implementing Shared Services in Government by Timothy J. Burns and Kathryn G. Yeaton

E-Government/Technology

*Biometrics: Enhancing Securit*y in Organizations by Babita Gupta

Leveraging Web 2.0 in Government by Ai-Mei Chang and P. K. Kannan

Best Practices for Implementing Agile Methods: A Guide for Department of Defense Software Developers by Ann L. Fruhling and Alvin E. Tarrell

Human Capital Management

Designing and Implementing Performance-Oriented Payband Systems by James R. Thompson

Innovation

Transforming Government Through Collaborative Innovation by Satish Nambisan

Managing for Performance and Results

Strategic Use of Analytics in Government by Thomas H. Davenport and Sirkka L. Jarvenpaa

Engaging Citizens in Measuring and Reporting Community Conditions: A Manager's Guide by Alfred T. Ho

Organizational Transformation

Four Strategies to Transform Governance by Keon S. Chi

Improving Service Delivery in Government with Lean Six Sigma by John Maleyeff

Presidential Transition

What the Federal Government Can Do to Encourage Green Production by Nicole Darnall

*The National Securit*y Council: Recommendations for the New President by D. Robert Worley

Strengthening Homeland Security: Reforming Planning and Resource Allocation by Cindy Williams